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INTERNATIONAL ABSTRACT OF SURGERY

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COLLECTIVE REVIEW

INDICATIONS FOR OPERATIVE INTERVENTION ON THE LABYRINTH IN INFECTIVE LABYRINTHITIS SECONDARY TO SUPPUR- ATIVE CONDITIONS OF THE MIDDLE EAR

By OTTO M. ROTT, M.D., CHICAGO

THE question concerning the advisability of operative intervention on the labyrinth in cases of labyrinthine infection secondary to suppurative disease of the middle ear spaces, has occupied the attention of otologists for the past decade; and while some definite views are beginning to evolve from the mass of conflicting opinions, there is still present some honest and well-founded difference of opinion concerning the question as to when the labyrinth should be opened or exenterated.

The author first passes in review, in chronological sequence, the various opinions held on this subject by a representative body of otologists during the past decade, so that from this short historical survey, an idea may be obtained of the advancing points of view during this period. Secondly, he presents a brief summary of the various opinions expressed on any particular phase of the subject. And lastly, he offers a few conclusions which seem to be justified from his study of the literature.

CHRONOLOGICAL REVIEW

1906

Freytag (1) did not attempt to set forth any special conditions which would influence his method of procedure, but contented himself with the broad assumption that "Operation on the labyrinth not only brings very little additional danger to the patient, but the prognosis of labyrinth suppuration is thereby improved."

Von Hinsberg (2) considers the different aspects of labyrinthitis, namely, diffuse manifest, diffuse latent, threatening or present endocranial complications, the influence of accidental operative dislocation of the stapes, the formation of a sequestrum, and the circumscribed infection; and in all but the last condition he advises the labyrinth operation.

Concerning the diffuse types, whether manifest or latent, he states that "the operation is always necessary when an exact functional examination (deafness and symptoms of irritation or defect of the vestibular apparatus) and the conditions found on exposing the middle ear cavities show that extensive disease of the labyrinth is present." In defense of his indications including the latent with the manifest types, he states "that it is in just these latent cases that a radical operation, if it does not invade the labyrinth, is frequently followed by meningitis."

Concerning the question of endocranial complications, he says that the suspicion of such a condition being present or threatening, indicates the opening of the diseased labyrinth.

While he does not hesitate to advise immediate operation on the labyrinth *after* symptoms of labyrinthine irritation follow the accidental operative dislocation of the stapes, he is not prepared to advise the labyrinth operation immediately in accidental operative dislocation of the stapes *before* symptoms of labyrinthine irritation appear. One reason is the difficulty in recognizing the

injury during the operation, most cases being recognized by the consequences.

The cases with the formation of sequestra in the labyrinth are regarded, with reference to indications for operation, as diffuse labyrinth suppurations, providing the sequesterum is movable, otherwise it is best to wait. When freely movable, the sequesterum should be extracted after enlarging the fistula between the middle ear and the labyrinth, if necessary. Hinsberg justified this procedure on the ground (1) that numerous cases have shown that the very severe symptoms of irritation disappear and the wound first begins to heal when the sequesterum has been removed, and (2) that the patient is constantly in danger of the onset of a meningitis.

While recommending the operator to wait if the sequesterum is not freely movable, because of the danger of forced loosening endangering the carotid, Hinsberg admits that the decision in these cases is not an easy one for the reason that if the sequesterum is permitted to remain, a threatening meningitis is always to be feared.

The one condition in which the labyrinth operation is not indicated is the circumscribed form, because this type frequently is recovered from and rarely leads to a fatal complication. That he does not forbid operation on the middle ear at this time is apparent when he states: "If the functional examination and the operation point to circumscribed disease of the semicircular canal, or if at operation a labyrinth fistula cannot be definitely proven, I think it best at first to wait, then to operate secondarily if the symptoms of irritation which were present before the operation do not quickly disappear, or if these should appear first after the operation on the middle ear."

Burger (3) is more conservative, stating that a labyrinth operation is indicated where the labyrinthine inflammation is coupled with intracranial complications. As to labyrinth suppuration even with serious labyrinth symptoms, he does not admit that the labyrinth operation is imperative, but says it is permitted, "because the indication depends a good deal on the surgeon, as one who does not sufficiently understand the topography of these parts should leave the labyrinth untouched under all circumstances."

In cases of nerve deafness and labyrinthic attacks without labyrinth fistula, he thinks it best to wait for the results of the middle ear operation. If the labyrinth symptoms remain serious or increase, then the opening of an apparently intact labyrinth capsule may be allowed, the personal factor of the surgeon playing here an important

part, but the trend of all of Burger's remarks is toward conservatism, as regards the labyrinth operation relying mainly upon the radical mastoid operation and the operative findings to guide him as to his further course. If a fistula is found, then the discovery of pus, especially when it is under pressure, and after removal returns from out the opening of the fistula, may lead to a direct opening of the labyrinth, rather than when a dry fistula is found in the lateral semicircular canal. The latter Burger considers as of the most frequent occurrence; and when such is the case the result of the middle ear operation must be waited for. But though the radical mastoid operation alone is advised in cases of labyrinth symptoms, Burger does not ignore the possible danger of setting up a meningitis in case there may be present a labyrinth suppuration, because he advises great care in the performance of the mastoid operation. Relative to this phase of the question he states:

Only very sharp chisels should be used and firm strokes must be avoided, the smallest bone splinters must be carefully removed during the whole operation, and the bone cavity carefully wiped by the surgeon himself under strong illumination and careful but not forceful stopping of the bleeding. The surroundings of a labyrinth defect should be left untouched; rather leave a few granulations in the neighborhood. The defect should not be probed. A sequester should not be removed if not loose. For the after-treatment it is better to leave the wound behind the ear open. Stiff tamponing should be avoided and in general, powder treatment without tampon is preferable. The route of the infection should be followed in suppuration of the oval window, the stapes if present must be removed, and if possible the window enlarged with a very narrow chisel downward, not upward. The lumen of a defective semicircular canal must be followed as far as the vestibulum.

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Dench (4) at this early date wrote exclusively concerning conditions accidentally found at the time of operation, thus making it evident that at that time he possessed no symptomatic indications for operative interference on the labyrinth. He says:

Granulation tissue about the stapes should be treated the same as granulation tissue in any other part of the tympanic cavity, and if it is necessary to remove the stapes in order to free this portion of the tympanum from granulation tissue, the stapes should be removed. Naturally, if there is no evidence of suppuration of the labyrinth after removal of the stapes, the oval window should not be enlarged, and the operator should content himself by simply shutting off the pelvis ovalis by means of a gauze drain, to prevent involvement of the labyrinth through the middle ear. If, however, pus is seen to flow from the oval window, the oval window should be enlarged forward and downward, so as to completely drain the vestibule. In those cases where the horizontal semicircular canal is the site of the invasion, the procedure will depend upon the

extent of the labyrinth involvement. If no pus flows from the semicircular canal, after the opening is enlarged, and if no granulations are present about the oval window the operator may content himself simply by draining the labyrinth through the horizontal semicircular canal, and from the cases which have come under my observation, I can say that he will feel fairly certain of eradicating the labyrinthine involvement by this method. If, however, there seems to be extensive involvement of the labyrinth, the opening of the semicircular canal alone will not suffice. After the canal has been thoroughly drained, the stapes should be extracted, provided its foot-plate is in position, and the oval window should be enlarged downward and forward, so as to freely drain the vestibule.

If granulations are found in the oval window, and upon curettement the stapes comes away, the operator should pass a delicate probe into the pelvis ovalis, to determine whether the oval window still remains closed by fibrous tissue, or whether the probe can be introduced directly into the vestibule. Naturally the utmost gentleness must be used in conducting this manipulation, as otherwise the membrane of the oval window might be ruptured and infection of the labyrinth take place at the hands of the operator. If the vestibular membrane is found to be ruptured, I do not think it wise to enlarge the oval window unless pus can be actually seen coming from the labyrinth. If the removal of the stapes shows a suppuration of the labyrinth, that is, if pus flows from the oval window after the stapes has been removed, enough of the external labyrinthine wall should be removed to afford free drainage. This is best done by the cautious use of a slender gouge and small curette, enlarging the oval window downward and forward. In other words removing the promontory and destroying the first turn of the cochlea.

Still freer drainage can be obtained in these cases by removing the external wall of the horizontal semicircular canal as well and this, I believe, should be done in cases where the labyrinthine involvement is extensive.

Blake (5), while not offering any symptomatic indications, recognized at this early period the importance of having symptomatic indications and a definite surgical procedure, because of the pathologic evidence of the extent of destruction within and including the labyrinth capsule when once septicly invaded.

At the same meeting Reik (6) said that "a positive diagnosis from a pre-operative study of our cases can seldom be made, hence in the majority of instances treatment must be instituted upon the basis of a probable lesion, the proof of whose existence depends upon an exploratory operation." In concluding his part of the symposium he states:

One is strongly tempted to try to draw some distinct picture which he could call a clinical entity and to it attach the name of suppurative otitis media or purulent labyrinthitis. I shall deny myself that joy. The whole subject is, as yet, in too chaotic a state. And, if it were possible, I do not know that it would be wise to draw such a picture at the present moment. Anything that might tend to check interest in this problem at the present time would be fatal to our study of one of the most obscure and dangerous complications of purulent otitis media.

Richard's (7) conservative views likewise are of interest chiefly from a historical point of view as it is evident that at that time he lacked the knowledge to be derived from Barany's work on nystagmus and the noise apparatus. After discussing (1) the diagnostic value of certain chief symptoms and tests, (2) the danger which attends the exploration of the labyrinth, and (3) the danger which attends the non-exploration of the labyrinth, he concludes as follows:

Considering the doubtful value of symptoms as indicative of actual invasion of the labyrinth, the difficulty of eliminating cerebellar disease, the unreliability of tuning forks in differentiating in this class of cases middle ear from labyrinthine lesions; the practical certainty that we will destroy the organ for the purpose of useful hearing, the actual danger to life should we commit the error of opening a normal labyrinth to an infected cavity, the certainty that the outer labyrinthine wall will in the great majority of cases perforate before the inner wall, the correct surgical attitude is, not to enter the labyrinth upon symptoms, etc., alone at the primary operation unless there is direct evidence that the labyrinth is involved. While I can imagine a combination of symptoms and circumstances which would cause one to open the labyrinth at the primary operation even in the absence of recognizable labyrinthine invasion, I have as yet met no case which presented such features, and it is to be sincerely hoped that the labyrinth will not suffer the indignity of reckless exploration and that it will not be entered without due consideration of the possible results to life.

Concerning conditions accidentally found at the time of the operation on the middle ear he says:

In case where a loss of the horizontal semicircular canal represented the only lesion in the capsule, we merely remove the carious area and follow it to its limit, and the route which we select depends upon the site of the lesion, which as a rule, is in the horizontal semicircular canal.

Where the labyrinth is involved in a true suppurative process and its various compartments are filled with granulation or pus, or both, bolder intervention is required and the route which we adopt resolves itself into the selection of that which from a manipulative standpoint is the most convenient, which least endangers the important structures in surgical relation, and which allows us to fully expose the limits of the disease. The only route which fully meets these requirements is posterior to the facial nerve and through the solid angle of the semicircular canals.

Barany (8) advocates the radical mastoid operation followed at the same time by opening the labyrinth as soon as the diagnosis of diffuse labyrinth suppuration has been made. In thirty patients thus operated upon after the method of Neumann he has not had any postoperative meningitis.

Neumann (9) considers the labyrinth operation indicated in those cases of circumscribed labyrinthitis where there is increasing temperature with meningeal symptoms. Analyzing his results in the various conditions of labyrinthine infection, seven different types of which are discussed, he

concludes: "In no case was the labyrinth operation as such the cause of the fatal result. On the other hand, the study of my cases has given the significant result that as a rule the fatal result was due to the failure to perform the labyrinth operation at the right time."

It is evident that at this time Neumann's indications for the labyrinth operation were determined by conditions found at the time of the mastoid operation, in connection with the results of the functional examination of the labyrinth made before the operation. His indications in seven individual types of cases are as follows:

1. Where the hearing and vestibular functions are intact and the radical mastoid operation reveals the presence of a fistula, it is decided that the fistula is not a real fistula but only a defect in the labyrinth wall. If spontaneous nystagmus appears, it is due to an irritation of the vestibular apparatus from hyperemia or increased pressure, and the labyrinth operation is contra-indicated.

2. Where the hearing is gone, the vestibular apparatus functioning (irritable) and the radical operation reveals a fistula, and if there is spontaneous nystagmus, the condition is one of circumscribed purulent labyrinthitis. The opening of the labyrinth is indicated if there is increasing temperature with meningeal symptoms. On the other hand if the temperature is normal or spontaneous nystagmus is absent, the labyrinth operation is contra-indicated.

3. When hearing is present, the vestibular apparatus does not react, and the radical mastoid operation reveals a fistula, the condition undoubtedly is one of circumscribed purulent disease of the semicircular canals, and the labyrinth operation is indicated in the presence of the other accompanying symptoms, especially increasing fever. The presence or absence of nystagmus plays no part in determining the operative indications.

4. Where the hearing function is present, the vestibular apparatus does not react and even though no labyrinth fistula is found at the radical mastoid operation, the condition is one of purulent labyrinthitis and especially if there is increasing temperature, the labyrinth operation is indicated immediately after the radical mastoid operation. This applies also to those cases where the laying bare of the middle ear area uncovers other complications such as deep-seated extradural abscess or cerebellar abscess.

5. Where the hearing power and vestibular functions are both destroyed, and a fistula is discovered in the labyrinth capsule, the condition is one of diffuse suppurative labyrinthitis, and without regard to the presence or absence of spontaneous nystagmus, operation on the labyrinth is absolutely indicated.

6. Where the hearing and vestibular functions are gone and there is no labyrinth fistula discovered, yet if spontaneous nystagmus appears, the condition is one of manifest diffuse purulent labyrinthitis and the one-sided opening of the labyrinth is absolutely indicated.

7. Where the hearing function is gone, the vestibular apparatus normal, and no labyrinth fistula discovered, the labyrinth operation is contra-indicated.

1908

Canfield (10) says that the indications for operation upon the labyrinth are met with in two classes of cases:

1. Those in which symptoms referable to labyrinth disease have not been present before operation.

(a) When a single perforation is discovered through a semicircular canal, from which pus escapes.

(b) When a perforation through the oval window is discovered whether pus is seen or not. In these cases marked deafness is present and extensive disease of the vestibule must be suspected.

(c) When labyrinth symptoms develop suddenly after a radical mastoid operation. The majority of these cases are due to a latent labyrinth suppuration, an acute exacerbation of which had been set up by the operation. In such cases the vestibule is to be opened widely and further operative measures governed by its condition. In isolated perforations through the horizontal semicircular canals in which no other evidence of disease can be demonstrated operation upon the labyrinth may be postponed.

2. Those in which labyrinth symptoms have been present before operation.

(a) When no fistula is found.

(b) When fistula is found.

When no fistula is found delay may be allowed, unless the pathologic change in the tympanum and mastoid is altogether too slight to account for the labyrinth symptoms.

When a perforation into the labyrinth is found in a case that has previously shown labyrinth symptoms the indication for opening the labyrinth is clear.

Dench (11) bases his indications on the temperature for he says it is wiser to wait for a few days at least before opening the labyrinth if there is little or no febrile movement, even though the labyrinth symptoms are acute.

Uffenorde (12) likewise does not advise operating as soon as a diagnosis of purulent labyrinthitis is made, but if the symptoms of labyrinth irritation do not quickly disappear by conservative methods, then operation is indicated. Other indications for the labyrinth operation are when meningitis serosa, deep-seated extradural abscess, or cerebellar abscess complicate the labyrinth inflammation, and when the internal ear is invaded by a cholesteatoma or a tuberculous process. He also adds that a purulent meningitis determined by lumbar puncture is not a contra-indication.

Jansen (13) favors operation as soon as labyrinth disease has been diagnosed in one of the principal parts.

Davis (14) in no uncertain words voices his protest against performing the radical mastoid operation in cases of acute labyrinth suppuration unless the labyrinth is at the same time extirpated, for he says "it is in just such cases in which the radical operation is done and the labyrinth is not removed that after from twenty-four to forty-eight hours, suppurative meningitis and death occur—it is far better to do no opera-

tion than to perform the radical operation, without at the same time operating on the labyrinth, since the radical operation alone exaggerates the pathologic conditions in the labyrinth and thereby enhances the danger of meningitis."

1909

Barany (15) says:

We are bound to operate on the labyrinth in every case of severe infection unless the general state of the patient is unfavorable, especially since the operation is not particularly dangerous.

1. In acute suppuration of the labyrinth.

(a) If there is fever, headache, foul secretion, pain in the mastoid, or periosteal abscess, the complete operation on the mastoid and on the labyrinth must be performed forthwith.

(b) If fulminating symptoms are absent we may, as in appendicitis, either proceed to operate on the labyrinth at once, or wait for from five to ten days (or until we suppose a satisfactory barrier has had time to form between the diseased area and the intracranium).

2. In latent diffuse suppuration of the labyrinth, the labyrinth operation must be performed at the same time as the mastoid operation, for this is the condition in which postoperative meningitis is most liable to occur.

3. In circumscribed suppuration of the labyrinth a decision is not so easily arrived at as in the foregoing. The reason is that in circumscribed cases the radical mastoid operation is often followed by healing and closure of the fistula. In many patients the vertigo will soon disappear, but in others it will continue for years, sometimes quite trifling in character, at other times so severe as to incapacitate the patient for work. In a minority of cases the disease spreads and diffuse purulent labyrinthitis ensues. In that event, of course, the case passes into Class 1, and immediate operation on the labyrinth is imperative. This danger, and the possibility of vertigo continuing after cure of the fistula, renders it, therefore, advisable to perform the complete operation as often as possible. In coming to a decision, the state of the hearing power should be taken into consideration. If the hearing in the affected ear is bad, the complete operation is to be preferred. If it is good, or if the hearing in the other ear is poor, then it is preferable to avoid interfering with the labyrinth in any way. These conditions apply, of course, only to circumscribed suppuration.

1910

Neumann's (16) views at this date are offered for comparison with those given three years previously. He says:

In considering the indications for operation we must observe the character, the area involved, and the tendency to extension of such a process.

Where indications for opening the labyrinth exist it is a matter of great importance to decide whether the labyrinth should be operated simultaneously with the radical mastoid operation or whether the labyrinth operation should be undertaken some time after the radical operation has been performed, as no definite indications existed at the time of the mastoid operation.

Simultaneous operation of the labyrinth is indicated in all cases where diffuse suppurative disease of the labyrinth has been confirmed by diagnosis. If this cannot be determined with absolute certainty the presence of intra-

cranial complications of labyrinthine origin is sufficient indication for the labyrinth operation. In circumscribed disease of the labyrinth the indications for operation depend on whether or not the circumscribed process may spontaneously heal after the radical operation, for, if this is not possible it is advisable to open the labyrinth, as there is danger of very protracted or no healing of the wound cavity produced during the radical operation, and the patient during all this time is constantly troubled and must even give up his occupation because of the continued labyrinth suppuration, and the symptoms, especially those of vestibular character, are continued until the circumscribed diseased area of the labyrinth has healed, or until the functions are destroyed by gradual involvement of the entire labyrinth.

Kopetsky (17) summarizes his indications for operation on the labyrinth as follows:

1. The indications for opening the labyrinth in acute infectious labyrinthitis following acute middle ear suppuration, and following acute exacerbations of chronic middle ear suppurations, are still a debatable question. If operation is elected, then it must be extremely extensive in area and promptly follow the first sign of meningeal irritation. In this class of case no reliance should be placed upon data from functional examination.

2. When labyrinthine suppuration appears as the sequela of chronic middle ear suppurations, or cholesteatoma, without demonstrable disease of the labyrinth, then operation may be limited to the middle ear spaces, a retrogression of the labyrinthine symptoms being within the range of possibility. Fistulae of the semicirculars, and erosions of the promontory, in cases with intact hearing, do not require operative intervention. When symptoms of labyrinthine involvement appear in the course of suppurative middle ear disease, or after operation on the middle ear, without fever, and without signs of meningeal irritation then an exact functional examination to determine the activity of the labyrinth is first demanded. If found functionally active, but of less intensity in reaction, no immediate labyrinthine operation is necessary, although surgery may become a necessity at a subsequent period. If function is totally lost, then prompt operation on the labyrinth, opening it extensively, is indicated to guard against meningitis.

Blackwell (18) takes the conservative stand that no surgical procedure should be started upon the internal ear until all symptoms of acute labyrinthine disturbance have subsided, because of the fact that practically all of the phenomena of acute labyrinthitis are capable of production either by irritation or disease of the middle ear without the existence of any actual bacterial infection of the internal ear itself.

Ruttin (19) advises the labyrinth operation only when there is total absence of labyrinth function as determined by the hearing, caloric, rotation, and fistula tests, otherwise the radical mastoid operation alone is done. If after mastoid operation, the clinical tests show that the labyrinth functions have ceased, the radical labyrinth operation is carried out at a second sitting.

Alexander (20) sums up his views in the following words:

In chronic labyrinthitis secondary to chronic middle ear suppuration, the indications for operative interference consist solely in the presence of an intracranial complication, an extension of the disease to the bone, the formation of fistula, or the existence of cholesteatoma of the labyrinth.

In hyperacute diffuse labyrinthitis supervening upon chronic suppuration of the middle ear, a temporizing conservative line of treatment is advisable.

In labyrinthitis coming on in the course of an acute otitis media there is no need to operate on the labyrinth itself (apart from a variety which resembles meningogenic labyrinthitis).

In labyrinthitis due to operative trauma immediate operation on the labyrinth is imperative.

In chronic circumscribed labyrinthitis with a fistula, the labyrinth should be freely opened up, since in any event, without any further extension of the disease, the hearing will be destroyed.

Concerning the question of the performance of the mastoid operation in the presence of a chronic or latent labyrinthitis without at the same time opening the labyrinth he says:

We cannot too strongly emphasize or too often repeat the warning that once operation is begun, the labyrinth as well as the middle ear must be operated on, otherwise death will almost certainly ensue from postoperative meningitis. The removal of a polypus and even such a simple manipulation as probing, may transform a latent into an acute labyrinthitis, passing on to infect the intracranium.

1911

Kerrison (21) advises the labyrinth operation in the acute stage only in the presence of signs of meningeal irritation, as the labyrinth operation is much less dangerous during the latent stage. In contradistinction to those authorities who believe that vomiting, headache, and elevation of temperature are indicative of meningeal irritation, Kerrison states that those symptoms are distinctly characteristic of vestibular irritation and not necessarily indicative of meningeal irritation. From this point of view we can appreciate Kerrison's statement that the latter condition is comparatively rare.

As to the question of performing a radical mastoid operation in cases of chronic middle ear suppuration with evidences of post-suppurative labyrinthitis, without at the same time opening and draining the labyrinth, Kerrison believes it unsafe.

He also believes it unwise to do a radical mastoid operation where a fistula leads to a functioning labyrinth, because of the danger of inducing a diffuse suppurative labyrinthitis.

Goerke (22) is not very enthusiastic over the value of the labyrinth operation; in fact he inclines to the view that simply opening the labyrinth

may actually give rise to meningitis, instead of preventing it, which was the original intention of the operation. If operation is done he believes the only safe procedure is the method of total ablation as practiced by Neumann. But he adds, in justification of his conservative stand, that although in recent times labyrinth operations are less frequent than formerly, he has not seen a single case recently in which he could say that the omission of the operation had led to the occurrence of meningitis.

Phillips (23) says that the labyrinth operation is indicated in acute diffuse purulent labyrinthitis. If the condition is one of perilyabyrinthitis as evidenced by an irritable labyrinth but with the spontaneous nystagmus to the affected side, then the radical mastoid operation alone is indicated in order to prevent extension of the perilyabyrinthitis to the labyrinth itself.

Urbantschitch (24) states that in the Vienna clinic the labyrinth operation is permitted only when the function of the cochlear and vestibular apparatus has been destroyed.

Ballenger (25) says that diffuse labyrinthitis occurring in the course of an acute otitis media constitutes the strongest indication for a labyrinthine operation. In such a case the operation should be performed without delay, as the progress of the infectious process is very rapid and may speedily involve the cranial contents.

The second indication for labyrinth operation is a fistula of the labyrinth discharging foul fetid pus, the cochlea and vestibular apparatus being totally destroyed by the suppurative process.

The third indication for labyrinth operation is disabling giddiness remaining after labyrinthitis, in which the cochlea is destroyed while the vestibular apparatus is only partially destroyed.

In chronic latent circumscribed labyrinthitis in which the cochlea and vestibular apparatus are still functioning do not operate.

1912

Ruttin (26) discusses the indications of the following five types:

1. Circumscribed labyrinthitis.
 2. Diffuse serous secondary labyrinthitis (when it follows the circumscribed variety).
 3. Diffuse serous induced labyrinthitis (when it arises suddenly and uncomplicated in cases where the labyrinth wall is intact or at least not perforated).
 4. Diffuse suppurative manifest labyrinthitis.
 5. Diffuse suppurative latent labyrinthitis.
- The two fundamentals by which he is guided are:

1. Not to destroy a still functioning labyrinth because due heed should be taken before destroying an organ of sense and because there still remains time for surgical interference when there is an advance of the disease to the stage of dangerous diffuse suppuration, as shown by complete loss of hearing.

2. The simple surgical principle *ubi pus ibi evacua* that is when a diffuse suppurative labyrinthitis is diagnosed, the labyrinth should be opened as well as the mastoid. As to performing only the radical mastoid operation hesays, "what surgeon will be satisfied in opening the superficial of two collections of pus (middle ear and labyrinth) which have but indifferent communication, and leave the care of the deeper abscess to Mother Nature?" Furthermore he adds "the patient thus afflicted (with a suppurative labyrinthitis) has the sword of Damocles (meningitis) hanging over his head, and it is just like cutting the thread that holds the sword to do the radical mastoid operation in this sort of case and leave the labyrinth to take care of itself."

In the circumscribed and the two serous forms, the radical mastoid operation alone is advised, because after this operation the labyrinth condition frequently heals and if the diffuse variety should supervene, he says there is still time to perform the labyrinth operation.

1913

Kerrison (27) says the operation is indicated in the following conditions:

1. Labyrinth infection following quickly upon surgical injury of the stapes; and to be of any value in such a case, surgical intervention must be prompt, i.e., before meningeal infection shall have had time to take place.

2. Suppurative labyrinthitis complicating acute purulent otitis media and accompanied by high fever, rapid pulse, headache, etc., unless he adds, those symptoms show a very early and progressive tendency to subside.

3. A latent labyrinthitis plus symptoms of chronic middle ear suppuration calling for relief.

4. Physical evidences found during the radical operation, of intravestibular suppuration as shown by pus escaping or granulations protruding from the oval window or from a defect (fistula) in the promontory, or the presence of a fistula leading to the vestibule through the horizontal canal.

The time of election of a labyrinth operation when such a choice is possible, Kerrison states to be when the acute symptoms have abated. In the above-mentioned classes, the author states

the time is not a matter of choice as the danger of delay is greater than the danger of performing the labyrinth operation during the acute stage—dangerous though this may be. While the surgeon is waiting for the acute symptoms to subside acute diffuse suppurative labyrinthitis may develop as a late complication or sequela of a protracted attack of suppurative mastoiditis or when it is secondary to a chronic middle ear suppuration because a very large proportion of such cases pass uneventfully, i.e., without intracranial involvement, to the latent stage of the disease.

Mackenzie (28) discusses the indications of the following types of labyrinthine conditions:

1. Hyperæmia of the labyrinth.
2. Acute diffuse serous labyrinthitis.
3. Circumscribed irritative lesion of the labyrinth.
4. Circumscribed destructive lesion of the labyrinth.
5. Perilabyrinthitis with sequestration.
6. Suppurative labyrinthitis.

As regards the suppurative form, Mackenzie prefers to open the labyrinth at once, though he acknowledges that there may be times when the conservative stand might be justified, as for instance when headache and fever are diminishing. However he adds: "Personally I am somewhat too timid to rely upon this treatment, knowing that a subsequent radical must be performed and the dangers it will invite, and furthermore believing that the labyrinth suppuration indicates a severe form of middle ear suppuration which may later give rise to other intracranial complications (sinus phlebitis, meningitis, extradural, cerebellar, or temporal lobe abscess), I prefer to rely upon the radical treatment."

Mackenzie adopts a more conservative attitude when he believes the acute diffuse process to be of the serous type because this type is frequently recovered from and some labyrinth function remains. And in this connection it may be well to state that he thoroughly condemns the practice of performing the radical mastoid operation alone, in any case of acute diffuse labyrinthitis.

When the condition present is one of hyperæmia of the labyrinth or one of circumscribed irritation, the conservative plan is advocated.

In the circumscribed destructive lesions the radical mastoid operation is advocated, the subsequent course on the labyrinth depending on conditions discovered at the time of the operation, just as Neumann advocated in 1907. All cholesteatomatous masses, granulations, necrotic bone, etc., are eliminated, care being exercised not to stir up the condition in the labyrinth for fear

of breaking the adhesions, which may have formed, and thus favor an extension of the suppuration.

If the lesion is about the oval or round windows or the promontory, it may be possible to prevent the extension of the suppuration, in which case one of the more radical labyrinth operations should be performed.

As regards perilyabyrinthitis with sequestration, Mackenzie advises removal of the sequestrum, followed by thorough curettement of all diseased tissue.

Shambaugh (29), basing his indications for operative interference in the labyrinth on the likelihood of the development of intracranial complications, mentions the following classes of cases as calling for the labyrinth operation:

1. Cases of labyrinth suppuration where clinical symptoms exist suggesting a beginning intracranial complication such as altered cerebrospinal fluid, severe unilateral headache, etc.
2. Cases where the labyrinth empyema develops as a part of a violent acute panotitis, where the indications for a mastoid operation exist.
3. Cases where the labyrinth suppuration develops as a sequel to chronic purulent otitis media where well-organized indications for a radical mastoid operation exist.
4. Cases where the labyrinth suppuration is complicated by erosion of the labyrinth capsule, by fistula formation into the labyrinth, by facial paralysis, or by sequestration of a part or the whole of the labyrinth capsule.

Brock (30) considers all operative interventions which are restricted to the middle ear as dangerous and contra-indicated in the presence of secondary involvement of the labyrinth in acute otitis media.

Duel (31) does not favor the labyrinth operation in acute cases unless there are sufficient evidences of the beginning of localized meningitis.

Henninger (32) favors the mastoid operation in acute cases of labyrinthitis and the labyrinth operation after the appearance of meningeal symptoms. Circumscribed cases are treated expectantly.

Whiting (33) says no labyrinth operation is indicated in the circumscribed variety, or in the diffuse serous form. Concerning the accidental discovery of a fistula during the radical mastoid operation, he says no probing or curetting should be done as this is considered ill-advised meddling. If after the radical mastoid operation has been performed, the fistula fails to heal and remains as a granulating island surrounded by an epidermatized cavity, the case must be reoperated upon and the necrotic area about the fistula removed.

In the acute diffuse purulent variety, the labyrinth operation is indicated especially if it complicates a chronic purulent otitis media. If on the other hand it supervenes upon an acute puru-

lent otitis media, Whiting says he has seen excellent results follow the simple mastoid operation, the operation being performed without the use of chisels or mallet. When, however, this simple mastoid operation has been resorted to as a palliative measure in acute diffuse purulent labyrinthitis, he cautions that the operator, instead of relaxing, should redouble his vigilance and be prepared upon complaint of headaches, if attended with a temperature above 100° , to do labyrinthotomy at once.

Concerning the question of doing a radical mastoid operation alone in the presence of the diffuse latent variety of labyrinth infection, he says we must either do the labyrinth operation or none at all.

Kerrison (34) discusses the treatment under the following subdivisions:

1. Diffuse suppurative labyrinthitis.
 - a. Typical uncomplicated case; acute stage.
 - b. With fistula; acute stage.
 - c. Following stapedia injury.
 - d. With meningeal irritation.
 - e. Latent stage.
 2. Circumscribed suppurative labyrinthitis.
 - a. Acute stage.
 - b. Latent stage.
 1. Group 1 characterized by total permanent loss of vestibular irritability (absence of caloric reactions) plus retention of a useful degree of hearing power.
 2. Group 2 characterized by some remaining vestibular irritability and hearing power. In this type there are recurrent attacks of vertigo.
 3. Diffuse serous labyrinthitis.
 4. Perilyabyrinthitis.
- But before taking up in detail the management of infective diseases of the labyrinth he draws attention to the following general facts:

Suppurative labyrinthitis *per se* is not a fatal malady. If resulting fatally, death is caused, not by the labyrinthine disease itself, but by some intracranial lesion to which it gives rise. The necessity in any case for immediate operation must be determined, therefore, not by the evidences of vestibular involvement, but by the danger of intracranial infection. If our experience, judgment, and diagnostic skill enable us to foretell from the physical character of the lesion and its clinical phenomena that meningeal infection is threatened or imminent, prompt surgical drainage of the labyrinth is clearly the rational and conservative method of treatment. On the other hand, if we are able to deduce from the character and course of the symptoms, a comparative freedom from such danger, early operative intervention is often distinctly contra-indicated.

Discussing then the individual types, Kerrison believes the labyrinth operation indicated (1) in the diffuse suppurative form with meningeal irritation; (2) in the diffuse suppurative form

following stapedial injury; (3) in the diffuse suppurative form (latent stage); (4) in the diffuse suppurative form where the radical mastoid operation is indicated, because the latter alone actually adds to the danger of intracranial infection; (5) in that form of the latent stage of circumscribed suppurative labyrinthitis in which there are periods of comparative comfort alternating with recurrent attacks of vertigo.

Braun and Friesner (35) advocate the labyrinth operation in diffuse purulent labyrinthitis and emphatically warn against the performance of the radical mastoid operation alone. If the labyrinth is not opened at the same time it is safer to refrain from operating. In the circumscribed variety the simple or the radical mastoid operation alone is advised, depending upon whether the middle ear suppuration is of the acute or the chronic type.

1914

Ballenger (36) says the labyrinth operation is indicated in diffuse suppurative labyrinthitis whether of the manifest or of the latent variety, and contra-indicated in the acute diffuse serous and in the circumscribed forms.

As to conditions found during the mastoid operation he says that a sequestrum should be removed and if pus is found exuding from a labyrinth fistula, the operation should be extended.

In closing, he somewhat modifies his first statement relative to urging the opening of the labyrinth in the acute diffuse manifest suppurative labyrinthitis, by saying that a labyrinth operation should not always be done, but should be considered.

Danziger (37) recognizes the necessity of performing the labyrinth operation in diffuse labyrinthitis complicating chronic otorrhoea, but thinks the condition is different when the diffuse labyrinthitis complicates acute middle ear suppuration. "For instance when it complicates within a day or two of the acute otitis without temperature or meningeal irritation, the condition is of the serous type and operation is contra-indicated; but when occurring after some weeks together with bone complications of the mastoid process, with temperature and headache, the condition is in all probability purulent and operation is indicated."

Welty (38) believes the labyrinth operation indicated in those cases of chronic suppurative otitis media which have only remnants of hearing on the one side and no caloric reaction or *vice versa*.

Dighton (39) advises complete labyrinthectomy for manifest diffuse purulent labyrinthitis.

Concerning the latent variety of diffuse purulent labyrinthitis, he says "no operation short of a labyrinthectomy should be dreamt of. The patient may live for years with an untouched latent labyrinthitis; but remove a polyp or do a mastoid operation, and it is like pulling the trigger of a loaded gun, off it goes."

For the circumscribed labyrinthitis a radical mastoid alone is advised.

Concerning the view shared by the German and Austrian schools that all operative interventions which are restricted to the middle ear, in the presence of secondary involvement of the labyrinth in acute otitis media, are dangerous and contra-indicated, Duel (40) states:

My own belief is that as experience accumulates, this will not be exactly the point of view taken by aural surgeons. There will be encountered cases in which the functional tests indicate a complete loss of function in the labyrinth in which an operation for the relief of the suppurative condition in the middle ear and mastoid is undoubtedly required, in which the exenteration of the labyrinth will be omitted either temporarily, for further observation, or permanently, owing to the fact that perfect recovery takes place without further operation. This is due to the fact that the labyrinthitis may have been entirely recovered from, with loss of function, without any necrosis of the bone, or without any remaining suppurating area within the labyrinth.

The almost universal advocacy of the operation has been due to the fact that the radical operation has frequently brought on an acute meningitis resulting from the starting up of the process in the labyrinth. For those who insist upon the usual method of doing the radical operation by the use of hammer and chisel, I believe the position expressed by Brock and held by the majority of aural surgeons at the present time, is the better one. In other words, it is better to exenterate the labyrinth at the time of the radical operation. Those who perform the radical operation by the use of instruments which avoid concussion, will be able to stop at the labyrinth in all cases where they do not find a definite fistula leading into the labyrinth, with evidence of necrosis.

I have had sufficient experience to feel warranted in deferring the labyrinth exenteration in cases where there is not some gross lesion which leads one into the labyrinth. Not by any means do all of these cases recover without a second operation, but enough of them do to justify the position. In my experience, none of the cases operated upon, avoiding the concussion resulting from the use of hammer and chisel or gouge, were precipitated into any of the untoward results, which have led so many surgeons to follow a dictum which too often induced them to break down barriers between the meninges and the old suppurative condition.

Leidler's (41) views are as follows:

1. Every diseased labyrinth dependent upon a purulent otitis whether acute or chronic, combined with a labyrinthogenous intracranial complications must be operated upon at once. Of these complications the lightest degree is represented by a persistent headache on the side of the affected ear.

2. Every labyrinth which shows involvement as a result of an acute or chronic otitis with symptoms of acute dif-

fuse labyrinth suppuration, advanced nystagmus of the third degree toward the healthy side, and lack of response to the turning test, must at once be operated upon in case the temperature is more than 38° C. or the symptoms do not abate within four days.

3. A labyrinth which, as the result of an acute or chronic otitis, is completely destroyed functionally, and does not comply with the indications just given, must at once be operated upon, in connection with the radical opening of the antrum in case a spot in the bony capsule shows a pathologic opening into the peri- or endolymphatic space (fistula, cholesteatoma, sequestra, tumor, etc.) or where there are persistent symptoms of irritation of the labyrinth, dizziness, nystagmus, and vomiting.

1915

In a recent paper Dench (42) has stated that the necessity for the complete labyrinthine operation is comparatively infrequent, and that the operation should be undertaken only in the presence of very definite symptoms, pointing either to acute labyrinthine involvement or to an acute exacerbation of a previous labyrinthine suppuration. When these symptoms occur, operative interference is imperative, and must be prompt if it is to be successful. The expectant plan of treatment, however, in dealing with cases of circumscribed labyrinthitis, or of a purulent labyrinthitis, which is quiescent, will probably be followed by the best results.

In justifying the performance of the radical mastoid operation alone in the presence of a latent labyrinthitis, he writes:

The more radical operators insist that with a dead labyrinth, no radical operation for chronic suppuration of the middle ear should be performed without complete extirpation of the labyrinth. Personally, I am inclined to believe that, given a dead labyrinth, in a case of suppurative otitis media, and where no labyrinthine symptoms are present, aside of course from the total deafness which must be present, but where there is no disturbance of equilibrium, and where, owing to the absence of this sign we are certain that full compensation has taken place, and where there is no temperature and no sign of a beginning meningitis, it is unwise to do a complete labyrinth operation. The radical operation for the middle ear suppuration, in a case of this kind, seems to fulfill all indications. Such patients should be carefully watched, however, during convalescence, and whenever there is the least suggestion of a lighting up of an acute inflammation within the dead labyrinth, as evidenced by rise of temperature, vertigo, nystagmus, and headache, complete labyrinthine extirpation should at once be performed. In three of my cases where this plan was followed the patients made a complete recovery.

1916

Saunders (43) thinks that with the ability to tell early what lesions will invade the cranial cavity, will come better results in our labyrinthine surgery.

Phillips (44) says the labyrinth operation is indicated in acute diffuse purulent labyrinthitis accompanying acute purulent otitis media, but not when following chronic purulent otitis media.

In serous labyrinthitis the operation is not indicated and if any doubt exists as to whether the case is serous or purulent the operation should be delayed, pending further developments.

In the circumscribed types and in those so-called cases of paralabyrinthitis, the radical mastoid operation alone is indicated.

In cases where the labyrinth capsule is found to be more or less necrosed and sloughing or where sequestra involving any portion of the labyrinth are found, the necrotic area should be removed, but so far as possible, the operator should avoid extending the procedure beyond the lines of demarcation.

Perkins (45) believes that the labyrinth operation is indicated in every case of diffuse suppurative labyrinthitis and if the differential diagnosis between a diffuse purulent and a diffuse serous form cannot be made, he believes, contrary to the opinion of Phillips (44) that it would be safer to drain the labyrinth.

As regards the latent form of diffuse suppurative labyrinthitis, he mentions three types of cases:

1. Those in which the middle ear process is healed and requires no treatment. These patients are usually doing very well and as there is no hope of regaining any function with or without operation there seems no reason for interfering, as the danger of meningeal inflammation has, as a rule, passed.

2. In the second class the latent purulent labyrinthitis is associated with a purulent otitis media. When this is the case, operative interference with the object of relieving the middle ear process becomes a grave procedure on account of the traumatism having a tendency to break down the barriers which nature has interposed between this suppurative process in the labyrinth and the meninges. It is, therefore, safer to open and drain the labyrinth at the time the radical operation is performed. The writer believes this drainage is sufficient; but some surgeons claim that the danger of intracranial infection is still further minimized by removing the posterior surface of the petrous pyramid to the internal auditory meatus, then opening and draining the subdural space in this location.

In one type of case an exception may be made to this rule and that is the healed cases shown by compensation on the rotation tests. In this event one would, until further evidence is forthcoming, be justified in performing a radical operation without at the same time interfering with the labyrinth.

3. The third class comprises those cases in which there is necrosis of the labyrinthine cap-

sule. When this occurs, either in the form of a fistula leading into a dead labyrinth or with the presence of a sequestrum, it is one's plain duty to remove the dead bone and afford adequate drainage.

As to the handling of a fistula in the circumscribed cases, Perkins says they should be left strictly alone.

Campbell (46) opens the labyrinth as soon as all labyrinthine reactions are abolished, whether the condition be purulent or serous. The one exception to the rule is where there is a completely ossified labyrinth, which condition is recognized by the so-called compensation nystagmus.

Broder (47) says that opening of the labyrinth, with no labyrinthogenous intracranial complication and no permanent symptoms of irritation of the labyrinth such as nystagmus, vertigo, and disturbed orientation is meddling and uncalled for. In latent suppurative labyrinthitis exenteration of the mastoid cells with curettement of the tympanic cavity suffices.

RÉSUMÉ

Reviewing the various opinions held by numerous writers at different periods of time, we are able to discover the changing points of view due to the advancing state of knowledge. For instance, we note that the earlier indications for the labyrinth operation were based almost exclusively on conditions accidentally discovered at the time of the mastoid operation; later these were controlled by the results of functional tests made prior to operative interference on the mastoid; and recently, in determining the necessity of the labyrinth operation, the importance of the operative findings have been supplanted, in favor of the results of the complete functional examination of the labyrinth prior to any operative interference.

To illustrate this point more concretely, Neumann's views (9) may be taken as representative of the second or midway stage in the evolution of the indications for the labyrinth operation. First, the indications rested entirely upon the operative findings and recently the symptomatic indications have been largely dwelt upon. Neumann made use of both in reaching his conclusions.

SUMMARY

1. The views of the various authors can be roughly classified as follows:

(a) Ultraradical, when the labyrinth operation is advised as soon as any form of labyrinthitis is diagnosed. Jansen (13) was the exponent of this view.

(b) Radical, when the labyrinth operation is advised during the acute stage of diffuse suppurative labyrinthitis, as soon as the diagnosis is made, without waiting for evidences of meningeal involvement. Those who subscribed to this view were Freytag (1), Hinsberg (2), Barany (8), Neumann (16), Ruttin (19), Urbantschitch (24), Ballenger (25), Mackenzie (28), Whiting (33), Braun and Friesner (35), Dighton (39), Leidler (41), Perkins (45), and Campbell (46).

(c) Conservative, when the labyrinth operation is advised only when meningitis is threatened or present. Those holding this attitude are Dench (11), Uffenorde (12), Barany (15), Kopetsky (17), Alexander (20), Kerrison (21), Shambaugh (29), Duel (31), Henninger (32), Danziger (37), Saunders (43), Phillips (44), and Broder (47).

(d) Ultraconservative, when no labyrinth operation was permitted during the acute stage. Blackwell (18) is the exponent of this view.

2. Another interesting phase of the subject and one which apparently has not been definitely settled, is the question as to the advisability of performing the radical mastoid operation in the presence of diffuse labyrinthitis, without at the same time opening the labyrinth.

While the consensus of opinion, which in some instances is quite dogmatically expressed, is opposed to the practice of performing the mastoid operation in these cases without at the same time opening the labyrinth, because of the danger of setting up a fatal meningitis, there are a few men who throw the weight of their authority in favor of such a practice in certain instances.

Those who condemn this practice are: Hinsberg (2), Davis (14), Barany (15), Alexander (20), Kerrison (21, 27), Ruttin (26), Mackenzie (28), Brock (30), Whiting (33), Braun and Friesner (35), Ballenger (36), and Dighton (39).

Those who favor the practice under certain conditions are Burger (3), Duel (40), Dench (42), and Broder (47).

Duel (40) thinks it is advisable in acute otitis cases providing all concussion is avoided; and Dench (42) believes the single operation is justified if the labyrinthitis is latent and there are no labyrinth symptoms.

3. Concerning the question of the danger of accidental dislocation of the stapes during the radical mastoid operation and the bearing of this accident on the indication for opening the labyrinth, only three authors express themselves; namely, Hinsberg (2), Alexander (20), and Kerrison (27, 34). Hinsberg (2), and Alexander (20) advise immediate operation on the labyrinth in cases of labyrinthitis following operative trauma,

while Kerrison (27, 34) goes one step further and advises the labyrinth operation as soon as the accident has been done, before the labyrinthitis develops. The reason given in each case is that the labyrinthitis which follows this accident usually gives rise to a fatal meningitis.

4. As to the course of procedure in the circumscribed variety, the consensus of opinion is in favor of the principle of non-operative interference on the labyrinth, excepting of course the ultra-radical views of Jansen (13) who operates upon all cases whether circumscribed or diffuse. However, Barany (15), Neumann (16), and Ballenger (25) deem the labyrinth operation in circumscribed labyrinthitis justifiable, when the irritable labyrinth continues to give rise to periods of such intense vertigo as to incapacitate the patient for work. Here, particularly if the hearing in the other ear is good, destruction of the irritable labyrinth is advised.

CONCLUSIONS

From a study of the literature covering the past decade, the following conclusions relative to the indications for operative interference on the labyrinth seem to be justified:

1. In acute diffuse suppurative labyrinthitis, the only time a labyrinth operation should be considered is when symptoms of meningeal involvement supervene upon those of the labyrinthine infection.

2. In any other type of diffuse labyrinthitis, no labyrinth operation, because of the labyrinthine condition, *per se*, should be performed. If, however, the middle ear suppuration is of such a type as to present indications for the radical mastoid operation, then the radical mastoid operation should be immediately followed by the labyrinth operation.

3. The only conditions presenting labyrinth symptoms in which the mastoid operation alone is indicated are: (a) that condition of perilymphitis, in which the labyrinth itself has not yet become involved and (b) the circumscribed variety of labyrinthitis, with the exception of those cases which continue to give rise to incapacitating symptoms of vertigo and in which hearing in the other ear is good. In this condition the labyrinth operation is indicated.

4. Should the stapes be dislocated accidentally during the radical mastoid operation or should appearance of the labyrinth capsule (as pus exuding from the oval window) at this time, draw attention to the possibility of a labyrinthitis, then the safer course would be to open the labyrinth at once.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Giddings, H. G.: Blood-Pressure as a Guide During Major Operation. *Interst. M. J.*, 1917, xxiv, 17.

The results of the observations in a series of 50 cases of major operations with a view of determining the value of blood-pressure as an index of condition are reported. For comparison, the pressure on entrance to the hospital was taken. The pressure and pulse were then noted before anaesthesia, when anaesthesia was begun, and at five-minute intervals throughout the operation; all specific procedures during operation were particularly noted.

The points to be especially noted as sources of error are: (1) the reading must be taken at the same level as the heart; (2) the cuff must be accurately adjusted; (3) the tubing must lie free; (4) the radial artery must not be on a stretch; and (5) about 10° of pressure must be allowed for error due to vasomotor paralysis in the recorder's finger tips.

At the start of anaesthesia there is a rise of pressure of 10 to 30° which soon falls, however, to the individual level, which is maintained unless danger arises.

In shock, there is a gradual fall in pressure of 5 to 10° fully 20 minutes before there is an appreciable rise in the pulse. Occasionally, however, these two changes may be synchronous.

In asphyxia, a rise of pressure occurs even before the usual darkening of the blood. Two cases of operations around the face showed this rise, and subsequent relief was afforded when the operator was warned.

Cerebral anaemia is preceded by a sudden alarming fall in pressure and marked slowing of pulse. As the cases occurred when reverse Trendelenburg position was used, the restoration to a level position resulted in immediate improvement of pressure and pulse.

Regarding the true Trendelenburg position, the cases showed an immediate fall of pressure which was, however, not alarming and which shortly returned to the individual level; the time in the position seeming to make no difference.

The author states in conclusion that while the blood-pressure index is a valuable guide in major operations or in cases likely to be prolonged, where shock is apt to appear, or where the case is previously run down, and in operations around the head or

neck giving warning of approaching asphyxia or cerebral anaemia, it is not a procedure to be used as a routine measure.
P. M. CHASE.

Cecil, H. L.: The Use of Kephalin to Hasten Coagulation and Haemostasis After Surgical Operations. *J. Am. M. Ass.*, 1917, lxviii, 628.

The need of haemostatic gauze to be used where packing is now necessary in deep-seated operations, such as perineal prostatectomies, in which bleeding occurs within the prostatic capsule from which large hypertrophied lobes have been enucleated, has long been recognized. Kephalin is made from the brains of hogs.

The gauze is prepared as follows: The kephalin is dissolved in an excess of ether, about a 5 per cent solution being made, and this concentrated kephalin solution is poured over gauze strips 6 feet long and 6 inches wide. The packs are then folded, rolled, wrapped in two muslin covers and sterilized in the steam autoclave at a temperature of 120° C. for ten minutes. The heat necessary to sterilize them effectively does not interfere with the coagulation action of the kephalin.

As soon as kephalin gauze packs were used, it became evident that haemorrhage ceased much more quickly than when iodoform gauze was used, and that it was unnecessary to introduce so much gauze as previously or to pack it as tightly within the capsular cavities.

After his success in prostatectomy, it occurred to the author that the bleeding which occurs after Young's "punch" operation — or median bar excision — might be stopped by a kephalin coating to the catheter drain which lies within the wound at the prostatic orifice. The kephalin-coated catheters were prepared as follows: A very concentrated solution of kephalin in ether was made and smeared on the terminal 3 inches of a large gum coudé catheter, the tip and eye of the catheter being left uncoated. This coating was best secured by allowing the solution of kephalin to drop on the catheter, which is being revolved at the same time. This coat is about 1 to 2 mm. thick and surrounds the catheter. The catheter is then sterilized in a glass tube by steam in an autoclave at a temperature of 120° C. for ten minutes. In this way a large amount of kephalin is brought into direct contact with the cut surface at the vesical orifice.

The kephalin has been used in four "punch" cases, the catheters being prepared as described above. Whereas previously these patients had frequently to have clots evacuated from the bladder, it was necessary in only one of the cases in which it was used, and in this case the clot was very small, being only large enough to plug the eye of the catheter.

The following conclusions may be drawn:

1. Kephalin causes a quicker and firmer clot.
2. Not as much pressure in packing is required to control hæmorrhage as when plain or iodoform gauze is used.
3. When the packs are removed, the clot is of sufficient firmness to prevent bleeding.

EDWARD L. CORNELL.

Chalier, A.: Primary Suture of War Wounds and Their Aseptic Treatment (De la suture primitive des plaies de guerre et de leur traitement aseptique). *Bull. et mém. soc. de chir. de Par.*, 1917, xliii, 21.

Chalier's report is a contribution particularly to the treatment of limb wounds observed in the pre-infectious stage.

Chalier's practice is primary suture, after careful systematic clearance and wide anatomic opening up and removal of all contused and necrotic tissues.

Faure, who submitted Chalier's report to the society, stated that there was a great movement in favor of this method. He was convinced of this from his visit to hospitals at the front. While all are agreed upon the utility in the case of fresh wounds of wide openings and extensive excision of damaged tissues and removal of foreign bodies, yet the agreement ends there. To clean the wound ought antiseptics be used or not? There are advocates of both and both show good results. The one thing that is certain is that purely aseptic treatment, or the employment of antiseptics of the most varied kinds, when mechanical lavage of the wound has been thoroughly done, give identical results; and this shows while the utility of antiseptics has not quite been demonstrated, yet they have not the harmful effects which opponents claim for them.

With regard to Carrel's method it is certain that it was a great advance and by it secondary suture of wounds was rendered possible in a great number of cases. At the present time, however, owing to the improvement of the immediate treatment of recent wounds, primary suture of wounds can very often be attempted with success. The author says that the good results obtained without Carrel's procedure are superior to those obtained with it because an immediate suture is evidently better than a secondary one. Depage has in fact recently reported that in wounds of the knee he had obtained better results from primary suture than from the method of Carrel which had been much better than the older methods. However, if the Carrel method does not show the advantages of immediate suture it does not show its dangers because during the critical period it leaves the wound open in par-

ticularly satisfactory conditions of drainage, etc. Immediate suture ought only be done when the surgeon can follow and observe his patient for at least fifteen days.

W. A. BRENNAN.

Chaput, H.: Amputation of the Leg at the Upper Third with Three Strips (Amputation de jambe à trois lambeaux au tiers supérieur). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 57.

The technique employed by Chaput in making an amputation at the upper third of the leg is as follows:

A circular incision is made at a distance of half the diameter of the limb below the proposed osseous section. Three vertical incisions are made to meet this circle, the length equal to half the diameter of the limb. One is made a fingerbreadth beyond the tibial crest, the second a fingerbreadth behind the internal border of the tibia, and the third behind the fibula. These vertical incisions mark off three strips, one internal or tibial, one antero-external, and the third posterior.

The dissection of the strips and the section of the bone are done in the usual way. Before suturing, the lower half of the tibial strip is resected and its lower edge rounded. The lower half of the internal edges of the two large strips are then sutured together and the small strip is sutured to the upper half of these same edges; finally the external and lower edges of the large strips are sutured. Lamellar drainage is instituted.

The advantages claimed for this method are that it is simple; that it requires less length of material than the external or posterior strips; and it is less liable to gangrene than the circular procedure or that with two equal strips because the small strip is wide and short and it furnishes an excellent stump.

W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Marquis, E.: Justification of the Employment of Alcohol in the Disinfection of the Hands (La justification de l'emploi de l'alcool dans la désinfection des mains). *Presse méd.*, 1917, p. 28.

Marquis' article is written because he fears recent criticisms may cause some doubt regarding the value of alcohol as a disinfectant of the hands among the large number of surgeons who use it.

Any substance employed to disinfect the hands should possess: (1) a bactericidal power for superficial germs, (2) the power of intra-epidermal penetration to reach deeper germs, (3) cleansing power.

Marquis shows that alcohol possesses these properties. It ranks immediately after tincture of iodine, before phenol, and much before corrosive sublimate. He thinks that for practical purposes alcohol is the best disinfectant of the surgeon's hands. During his war experience he has seen the incomparable services which its use rendered. Now, when sepsis in fresh war wounds is as important as in normal surgery, whatever contributes to ob-

taining asepsis, such as the rapid and under all circumstances easy disinfection of the hands, acquires a really considerable importance by facilitating more rapid recovery of the wounded.

W. A. BRENNAN.

ANÆSTHETIC

Santoni, A. D.: Some Remarks on Regional Anæsthesia (Quelques remarques sur l'anesthésie régionale). *Presse méd.*, 1917, p. 67.

The author has tried the effect of hypertonic or hypotonic solutions in favoring regional anæsthesia by dissolving novocaine in serum containing 15, 20, and 30 per cent of chloride of sodium and in pure sterilized water. Although his study is not completed the results obtained show that very good anæsthesia is obtained in the majority of cases by infiltration with solutions at 1:400.

Hypotonic solutions give a rapid anæsthesia but it only lasts about one hour. Hypertonic solutions act more slowly but for a longer time. The author believes that the sodium chloride by altering the osmotic tension, exercises a physical inhibition on the nerve-fibers which is added to the specific effect of the anæsthetic itself. W. A. BRENNAN.

Boyd, A. S., and Yount, C. C.: Routine Spinal Anæsthesia, with Report of 6,229 Cases. *J. Am. M. Ass.*, 1917, lxxviii, 601.

The administration of the anæsthetic has not been restricted to any one or to any set of operators. In all, twenty-seven different physicians have contributed to this series of cases. The majority of the patients were West Indian negroes and native Panamanians of the poorer classes, of low mentality, and by no means neurotic in tendency. They submitted to operation with a minimum of mental distress.

The most consistently good results were obtained with the following preparation:

	Ampul.	
Stovaine.....	0.05 gm.	0.1 gm.
Sodium chloride.....	0.05 gm.	0.1 gm.
Distilled water.....	0.5 ccm.	1.0 ccm.

In the last two years the dose has been cut down to an average of 0.07 gm., with a maximum of 0.085 gm. For operations requiring one-half hour or less, 5 cg. are given. For longer operations the dose is increased proportionately.

In 226 consecutive cases injected by one having had a large experience in the method, there was one complete and one partial failure, about 0.8 per cent. In 479 cases injected by six different physicians, there were 16 complete failures, 9 partial failures, and 4 repeated injections, about 6.25 per cent failures. On three occasions it was necessary to stop the operation temporarily on account of respiratory failure. Artificial respiration was begun and continued in each case until the patient was able to

breathe. In one case it was necessary to continue the artificial respiration fifty minutes.

Vomiting is a very uncommon after-effect. It was noted at times in conjunction with symptoms of meningismus, occurring usually about the third day. If postoperative vomiting occurs, it can usually be traced to some definite cause other than that of the anæsthetic. Mild headache and backache occurred in about 20 per cent of the cases. They yield readily to the usual headache remedies. Temporary loss of vesical control is fairly frequent, following operations on the rectum and perineum.

In no case was a permanent paralysis of any kind observed, nor gangrene of any structure resulting from spinal analgesia. There were no cases of meningitis developing after the puncture.

There were four deaths in which spinal analgesia was a factor. In only one did it seem to be the sole cause of death.

Spinal analgesia has a fairly wide field in which it is the anæsthetic of choice, in many respects, namely, for hernia, except those varieties occurring above the umbilicus; all genito-urinary operations except those involving the kidney and upper ureters, and for operations on the rectum, anus, perineum, vagina, cervix, and lower extremities. Pelvic operations and other intra-abdominal operations below the umbilicus can be done very satisfactorily with spinal analgesia.

Spinal anæsthesia does not seem to be sufficiently satisfactory for operations on the upper abdomen and thorax to warrant its general use there.

EDWARD L. CORNELL.

Fischer, W.: Sacral Anæsthesia (Ueber hohe Sakralanaesthesia). *Deutsche Ztschr. f. Chir.*, 1916, cxxxvi, 561.

Fischer states that in the surgical ward of the Worms Hospital epidural anæsthesia was carried out with success in operations below the diaphragm (stomach, kidneys, and gall-bladder operations) as well as in operations on the lower extremities. In a total of 155 cases, 86.5 per cent showed perfect anæsthesia; 4.5 per cent showed insufficient anæsthesia which had to be supplemented; 9 per cent of the cases were failures.

Epidural or extradural anæsthesia is an excellent method. Its drawbacks are that the technique is by no means simple and at times the effect is too limited; but these are offset by the much greater advantages, especially the greatly diminished secondary effects. The usual dosage injected was 70 ccm. of a one and one-half per cent solution of novocaine. Morphine was injected half an hour before operation. Full anæsthesia was generally induced within twenty minutes after injection. The author reports one death after injection. This was in the case of a woman 56 years old, much emaciated, with perforating peritonitis following a pyloric ulcer. Autopsy was refused. The author thinks that this was a hopeless case; but it is possible that the dose

administered was somewhat too large. The method may be contra-indicated for anatomic or constitutional reasons.

W. A. BRENNAN.

SURGICAL INSTRUMENTS AND APPARATUS

Leriche, R., and Heitz, I.: *The Action of Peri-arterial Sympathectomy upon the Peripheral Circulation* (De l'action de la sympathectomie peri-arterielle sur la circulation périphérique). *Arch. d. mal. du coeur.*, Par., 1917, x, 79.

Peripheral sympathectomy, i.e., denudation of the large arteries of the limbs and tearing away the sympathetic plexus which grip them in a continuous sheath, was proposed by Jaboulay in 1899. He tried it in intermittent claudication and certain visceral disturbances. Although there were some striking successes the procedure fell into disuse.

In 1913 Leriche made further trials and found that a surer result could be obtained by section of the sympathetic fibers combined with total resection of the perivascular sheath for a certain length. This gave good clinical results. The authors have tried this method in a number of war wounds; not alone in cases of causalgia but also with parietic or spasmodic disturbances of the extremities, corresponding to the type recently described by Babinski and Froment under the name of "reflex disturbances," and which are characterized by the absence of reaction of degeneration associated with certain objective symptoms in which vasomotor and thermic disturbances occupy the chief place.

The method of operation has always been the same. After exposure of the vessels and separation of the main nerve-trunks the artery is attacked and the cellular sheath which is firmly adherent to it is stripped for about 6 to 9 cm. It is difficult to remove the sheath without tearing it into strips.

The first effect noticed after denudation is a retraction of the artery which gradually diminishes. Vasodilator reaction appears early, generally in less than thirty-six hours. It is heralded by elevation of temperature in the limb which contrasts with prior hypothermia. This thermic reaction has been noted in all the authors' cases. There is also an increase in arterial pressure in the operated limb which usually becomes a hypertension. This as well as the hyperthermia generally disappears after a time, and there is also a disappearance of troubles due to circulatory disturbances in the limb.

These clinical phenomena are quite in accordance with the experimental facts determined as far back as 1832 by Claude Bernard and which the authors discuss.

W. A. BRENNAN.

Davis, G.: *Method of Plaster Splinting for the Treatment of Knee Lesions.* *Lancet*, Lond., 1917, xcii, 298.

Essentially this method consists in a thigh plaster and leg plaster conjoined by three equidistant

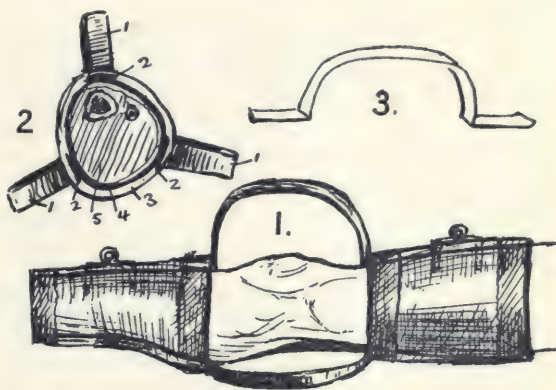


Fig. 1. Inner side of leg and thigh, showing splint applied and coat-sleeve mackintosh and rings of wire to affix to Balkan.

Fig. 2. Section of leg seen from below with plaster and iron arches. 1. Arches of hoop-iron. 2. Flanges in thickness of plaster. 3. Plaster of Paris. 4. Flannel roller. 5. Section of upper part of leg.

Fig. 3. The hoop-iron arches.

arches of hoop-iron. The points of the method are:

(1) The interrupting supports radiate from a point in the center of the limb and resist mobility equally in all planes. (2) The iron hoops being covered with plaster become one with the splint, are much strengthened and much smoother, and less awkward. (3) There is sufficient room for dressings, however bulky. The splint can be made much more serviceable by having an extension of plaster around the pelvis — a spica.

The splint is especially suitable for all cases of long-continued suppuration of the knee and for cases of resection of the knee-joint, also where the tibia is fractured into the knee or where infection has reached the joint from a wound in the tibia. It will be most useful where fibrous ankylosis is the best prognosis permissible from the nature of the injury.

The materials required for making the splint and the detailed technique of its application are fully described.

The splint so prepared should be very comfortable and a welcome support. It should last four to seven weeks, by which time further progressive emaciation of the limb may require a fresh splint to be made. The limb, splint and all, is slung from a Balkan frame. The dressings can be done with the minimum of pain, and perfect alignment of the limb is assured. The patient can bear to have the limb handled and be moved on to a couch or spinal chair and so be benefited in health and spirits by being out in the open air.

It is easy to make additions to this apparatus, either of a plaster to include the foot or one to surround the pelvic girdle, or both.

P. G. SKILLERN, JR.

SURGERY OF THE HEAD AND NECK

HEAD

Marien and Saint-Pierre: Conjunctivoma or Angiofibrosarcoma of the Face (Conjonctivome ou angio-fibro-sarcome de la face). *Union méd. du Canada*, 1917, xlvii, 161.

The authors report a case of face tumor in a man of 65 years which they describe as an angiofibrosarcoma. The tumor was about the size of a large orange, of ovoid shape, with regular surface showing two poles. Histologic examination was made from sections cut from each pole. One of the poles penetrated the cavity behind the nasal fossæ, the other projected into the face, penetrating the nasal and orbital cavities, the right eye being much compressed. The tumor was implanted on the inferior face of the sphenoid by a sessile base. The soft parts, buccal and nasal mucosa, skin and cheek, were not invaded. They were merely pushed away and distended and not affected otherwise by the tumor, except as the blood supply was concerned.

From the histologic findings and the classification of Cornil and Ranvier a diagnosis was made of a multiple tissue mixed malignant tumor, i.e., a conjunctivoma.

The tumor was removed by being freed from the normal parts surrounding it. Three incisions were necessary. One transverse from the angle formed by the nose and internal canthus and extending to the zygomatic arch. A second incision descended along the nose as far as the upper alveolar border without opening the buccal cavity. A third incision extended from the zygomatic arch and descending circumscribed the base of the tumor and curving joined the upper edge of the lip. These incisions permitted complete disengagement of all soft parts and incision of the periosteum to the bone. There were no complications. There is a probability of its recurrence *in situ*. W. A. BRENNAN.

Fenger, F.: The Composition and Physiologic Activity of the Pineal Gland. *J. Am. M. Ass.*, 1916, lxvii, 1836.

Experiments with this gland within the past few years have demonstrated that where it has been fed to young animals such as dogs, guinea pigs, chicks, rabbits, cats, etc., it caused them to outgrow the control animals both in size and sexual maturity. The addition of even small amounts of the desiccated gland to the food of such animals is said to be sufficient to produce marked results. It has also been found that infant glands are more active and give better results than adult glands.

The present investigation was carried out for the purpose of determining the constituents and physiologic activity of this gland and to ascertain if any difference exists in glands from different species and

between glands from young and from mature animals. Cattle, sheep, and lambs, which usually furnish the raw material for pineal preparations in this country, were selected for this purpose. Approximately 900 glands from full-grown cattle were collected during March, 1915. During December, 1915, and January 1916, 1,548 glands from cattle, 1,348 glands from sheep and 5,062 glands from lambs were obtained. The glands were removed from the brains immediately after the heads were opened, and carefully trimmed, which in this case is a very easy matter, the author states, as the glands have but little connective tissue attachment and are free from adherent fat.

The author's experiments indicated that there was no material difference between the extracts made from infant's glands and those from adult glands, and yielded nothing to sustain the view that the pineal gland has an active endocrine function of importance during either infancy or adult life. The pineal is apparently not essential to life, and seems to have no influence on the well-being of the animal.

Comparisons were made between pineal glands from cattle, sheep, and lambs. It was found that beef glands are relatively small and that both sheep and lambs contain much more pineal tissue per unit of body weight than do cattle. Infant glands contain less phosphorus and more total nitrogen than adult glands.

Pineal glands from both species showed only slight contracting power on unstriated muscle. This is very much less than that produced by equal amounts of the posterior lobe of the pituitary body, and not sufficient to be of physiologic significance, the author states.

Since the action of pineal glands on the blood-pressure, the pulse-rate, and the excised heart, as well as on the uterine and intestinal muscle, is insignificant in therapeutic doses, and since the health is not influenced by extirpation of the gland, it becomes difficult, at least with the present knowledge of physiologic chemistry, to accept or even consider the pineal body as an internal secretory organ of medicinal value. GEORGE E. BEILBY.

Eisendrath, D. N.: Head Injuries—Two Cases Complicated by Symptoms of Intracranial Involvement. *Surg. Clin.*, Chicago, 1917, i, 169.

Head injuries must be studied from the standpoint of brain and cranial nerve injury and not of bone injury.

The routine examination of head injury includes:

1. Examination of vertex for evidences of fracture.
2. Lumbar puncture.
3. Radiography (stereoscopic) of skull.

4. Special signs of basilar fracture. (These are tabulated in the original article.)

5. Determination of whether symptoms of: (a) concussion or later acute spreading œdema, (b) contusion, or (c) compression and pressure.

6. Search for evidences of infection after thirty-six to forty-eight hours.

The author advocates repeated lumbar puncture for cases of severe concussion or even cerebral contusion. He is not in favor of subtemporal decompression in such conditions. These cases should be kept in bed four weeks.

The author agrees with Frazier's classification of therapeutic indications, which are detailed in the article. Two cases of head injury were presented and discussed.

K. L. VEHE.

Villandre, C.: Metallic Intracranial Foreign Bodies Apparently Tolerated (Corps étrangers métalliques intra-craniens tolérés en apparence). *J. de méd. et de chir. prat.*, 1917, lxxxviii, 129.

Villandre refers to a recent report of Marie in which he referred to 31 cases of wounded soldiers who not only retained a projectile in their brain with no irritation, but in the majority of cases were not even aware of the presence of the foreign body.

Villandre does not agree with Marie's belief that it is unnecessary to seek a projectile when it is causing no trouble and that the presence of the projectile is less dangerous for its bearer than would be any operation for its extraction. Villandre thinks that such tolerance of projectiles is apparent only, and that at any time grave complications may ensue; that such projectiles still harbor microbic agents, the virulence of which may be great even after long months of apparent toleration; and that a well-conducted operation is not dangerous.

In the author's service 20 such cases with tolerated cranial projectiles were observed. The developments are shown in the following table:

Number of cases observed	20
Still in observation	3
In which a fistula was developed	3
Accompanied by abscess	3
With development of Jacksonian epilepsy	3
With hemianopsia	1
With tolerated projectile (3 aseptic)	6
With projectile not extracted	1
Two of these cases (abscess cases) died.	

The author believes that metallic foreign bodies, whether superficial or deeply embedded in the interior of the encephalic mass, are a permanent source of danger and in the majority of cases should be extracted as rapidly as possible.

W. A. BRENNAN.

Bégouin: Cranioplasty by Splitting of the Scalp (Cranioplasti par dedoublement du cuir chevelu). *Gaz. heb. d. sc. méd.*, Bordeaux, 1917, xxviii, 6.

In a patient who had received a cranial wound in the left parietal region and in which the insertion



A and B showing scalp halved and doubled back into gap. (Bégouin.)

of a cartilaginous graft according to Morestin's method could not be carried out without danger, Bégouin closed the cranial breach by splitting the scalp in the vicinity and doubling back the divided strip to fill the gap. The method will be easily understood from the illustration. This gave an excellent result. On palpation no depression could be felt, nor pulsations, and no pain was provoked. The æsthetic effect is also excellent. Although not a method of choice the author thinks it very useful where other methods cannot be used.

W. A. BRENNAN.

Fur, R. le: Two Cases of Cartilaginous Cranioplasty for Large Loss of Cranial Substance Complicated by Voluminous Cerebral Hernia (Deux cas de cranioplastie cartilagineuse pour large perte de substance crânienne compliquée de volumineuse hernie cérébrale). *Paris chir.*, 1916, viii, 505.

In the first of the two cases reported by Le Fur the cranial opening was the size of a five-franc piece. There was a voluminous cerebral hernia and the cerebral pulsations were very clear. A piece of cartilage was cut from the tenth rib, size 2 cm. x 4 cm., with which the surface of the breach was covered. This was imbricated between the dura mater and bone in such a manner as to reduce the hernia considerably. Suture of the scalp and capillary drainage completed the operation. Five months later the patient was quite well. There is no cerebral disturbance but there is still an intracranial projection at the site, for which operation is refused.

W. A. BRENNAN.

Sicard, I. A., and Dambrin, C.: Cranial Plastics Using Sterilized Human Cranial Bone (Plasties du crâne par os crânien humain stérilisé). *Presse méd.*, 1917, p. 60.

In a certain number of cases where cranial plastic operations were necessary the authors have used plaques of sterilized human cranial bone to fill the osseous breach. A piece of cranial bone, homologous to that which is lacking, is taken from a fresh autopsy case. It is boiled for two to three hours and then shaped and trimmed as necessary. To sterilize it, the plaque is put in pure ether for twenty-four hours, then in a solution of equal parts of ether, alcohol, and formol for a day. Finally it is put under moist heat at 120° for half an hour. A higher temperature would soften and spoil the piece for use. It is tested by being immersed in bouillon;

if the liquid remains clear the graft is ready for use. Operatively it is fitted to the breach like a watch glass, sutured, and rebatted as far as possible with periosteum stripped from the surrounding area.

The method has been carried out on 9 patients, the oldest case being nine months old. The results have been perfect. In a few earlier cases where the sterilization was not so thorough and there was no bacteriologic control there were some setbacks. The authors claim that this method has advantages over ivory or metallic plates and over the cartilaginous graft carried out particularly by Morestin. Besides it avoids the secondary complication and disfigurement due to cutting the graft from the patient.

Experiments made on rabbits, either in the filling of artificial breaches or simple inclusion of the human graft in cellular tissue, show that it was perfectly tolerated. Examination of grafts after seven months showed them covered with a dense fibro-connective membrane. On the animal cranium the union between the graft and the osseous breach is intimate. Further results must be awaited from human cases, but the author is inclined to think that such will be more favorable even than the animal experiments.

W. A. BRENNAN.

Rueda, F.: Slow Cerebration in Cranio-Encephalic Surgery (Cerebracion lenta en la cirugia craneo-encefalica). *Rev. Ibero-Am. de cien. méd.*, Madrid, 1916, xxxvi, 357.

Slow cerebration has been noted by certain English surgeons as a post-traumatic symptom in fractures of the skull.

The author refers to two cases, one in a boy who received an injury in the superior part of the right temporal fossa and the other developing as a result of mastoiditis found to be due to a caseated cholesteatoma.

In the first case there was no evidence of fracture; but the symptoms not abating, the author made an exploratory craniotomy at the site and on exposing the dura a slight hernia of cerebral substance was found. Forty-eight hours after treatment the boy answered questions normally. A similar effect was noted in the other case after disappearance of the mastoiditis.

W. A. BRENNAN.

NECK

Griffith, A. S.: Types of Tubercle Bacilli in Cervical and Axillary Gland Tuberculosis. *Lancet*, Lond., 1917, cxcii, 216.

The author gives the results of the study of 52 cases showing that in childhood cervical gland tuberculosis is caused more frequently by the bovine than by the human type of tubercle bacillus, nearly three-quarters (72.1 per cent) of the cases in children under ten years of age having yielded bovine tubercle bacilli. In persons over ten years of age infection of human origin is more common, bovine

infection accounting for about a third of the cases in the ten to twenty year period and for rather less than a fifth of the cases in persons over twenty years of age.

D. N. EISENDRATH.

Ochsner, A. J.: The Indications for the Technique of the Surgical Treatment of Goiter. *Surg. Clin.*, Chicago, 1917, i, 47.

The author presented and operated upon three cases. The first was a large diffuse colloid adenoma which was causing choking and difficulty in breathing, and the other two were exophthalmic goiters.

Ochsner gives his goiter cases morphine, gr. $\frac{1}{4}$, and atropine, gr. $\frac{1}{100}$, one-half hour before operation at which time they are thoroughly anesthetized with ether by the drop method while recumbent. Then the ether is stopped and the patients are elevated to an angle of 45° ; the operation is begun and finished before the patient awakes. This procedure reduces the dangers of postoperative pneumonia. Atropine reduces the tracheal and pharyngeal mucus. The semi-erect position causes a cerebral anemia which makes a minimum amount of ether effective. Over 500 thyroidectomies have been done in this clinic with this method.

In the operative technique Ochsner always uses the transverse collar incision but seldom cuts the infrahyoid muscles transversely, the gland being delivered in the midline between them.

Hæmostasis is effected before cutting by grasping the superior pole containing the superior thyroid artery and vein with two forceps on the proximal side and one on the distal side. The lower pole is likewise grasped. In excision a piece 4 cm. by 2 cm. is left of the posterior capsule. This prevents injury to the recurrent laryngeal nerve and removal of the parathyroid bodies. Great care is taken in ligating because serious hæmorrhage results from retraction of the thyroid vessels.

Drainage is obtained by a stab wound just below the suprasternal notch and by use of dry gauze and a Kocher glass drainage tube. The latter is removed on the second day, the former on the fourth day.

In the after-treatment on reaching her room the patient's head and shoulders are elevated on a head-rest and 500 ccm. of warm normal salt by proctolysis is given, and repeated every four hours. If the pulse rises and the patient becomes nervous morphine, gr. $\frac{1}{4}$, and atropine, gr. $\frac{1}{100}$, are given and then in one-half hour a hypodermoclysis of 1,000 ccm. is administered. This may be of necessity repeated several times but will usually prevent a postoperative thyrotoxicosis in the exophthalmic cases. Water per mouth is given freely after nausea ceases.

Explicit directions governing the postoperative activities of these patients as to mental and physical rest, fresh air, and diet are given them in printed form. These are presented in detail.

K. L. VEHE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Gatellier and Barbary: Mortality in Penetrating Chest Wounds of War; Its Most Frequent Causes (*La mortalité dans les plaies pénétrantes de poitrine par projectiles de guerre; ses causes les plus fréquentes*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 509.

The authors' report concerns 165 cases of penetrating chest injuries in which there were 30 deaths, 18.68 per cent. Aside from multiple lesions other than the thoracic injury there were 154 isolated thoracic wounds with 20 deaths, 12.91 per cent.

The very great gravity of open thorax appears clearly from the author's statistics:

27 cases of open thorax with 6 deaths, 25.8 per cent.

127 cases of closed thorax with 14 deaths, 11.11 per cent.

The mortality was higher in the first forty-eight hours:

7 deaths in from 2 to 24 hours.

8 deaths in from 24 to 48 hours.

2 deaths in from 3 to 8 days.

3 deaths after 8 days.

The mortality was especially high in wounds with largely open thorax; 5 out of 10 died. When the thorax was less widely open the pleura was frequently secondarily infected, particularly when the wound trajectory was long.

An important complication was the rapid early development of septic pleuropulmonary accidents; 7 deaths were so caused in from two to ten days.

Another important complication was mediastinal emphysema. In 2 of 3 cases observed by the authors the patients died despite multiple incisions.

In the discussion HARTMANN pointed out that in the treatment of acute mediastinal emphysema Gatellier and Barbary had made lateral subclavicular incisions. In his opinion, such incisions do not easily allow an evacuation of air, as the sternomastoid muscle by its contractions closes the valvular orifice created. In the recovered cases subternal median incisions followed by tearing of the pre- and peritracheal tissues had been made.

W. A. BRENNAN.

Beck, E. G.: A Radical Cure of Osteomyelitis of the Ribs. *Illinois M. J.*, 1917, xxxi, 107.

The principles of a procedure for radical cure in osteomyelitis of the ribs are presented by the author who uses the results in 16 cases as a basis.

In 10 of the cases the osteomyelitis was confined solely to the ribs and in 6 the sternum was involved. All were very chronic, beginning as an intercostal neuralgia, rheumatism, or pleurisy, and all had had several operations, one having had 16 in all.

The etiology was tubercular in the majority of cases; in three a clear history of typhoid was found.

Of the 16 cases, 14 are entirely healed; one is under care now and one is unimproved. Injection of bismuth paste cured only three of the series without resort to surgical measures, a result not usually found in other forms of chronic suppurating sinuses. This fact is due to the disease affecting the medulla of the bone primarily which prevents the paste filling all the infected crevices.

All cases were injected with the paste, however, as a diagnostic measure to locate the infected bones. This is the only reliable method.

After several months' trial with the paste those cases still suppurating were subjected to a radical removal of all diseased tissue. Beck condemns the blind curettage of bone cavities and insists upon free exposure. The cavity following resection of the diseased area, is left open and packed with gauze allowing the surfaces to heal by granulations. The skin-flap, however, is placed in the deepest part of the wound and gauze packed against its outer surface. After granulations have formed, epidermization is hastened by adhesive strapping.

The detailed data of a specimen case is given.

P. M. CHASE.

Saviozzi, V.: Penetrating Gunshot Wounds of the Thorax (*Ferite d'arma da fuoco penetranti del torace*). *Clin. chir.*, Milan, 1916, xxiv, 941.

The author relates the clinical details of 28 personal observations of penetrating thoracic wounds due to gunshots. In the treatment of these wounds he had to deal with 17 cases of hæmothorax, 4 of hæmoptysis, 4 of localized emphysema, and 1 case of generalized subcutaneous emphysema. With regard to hæmothorax the author makes a short survey of the literature to show that numerous questions connected with it, especially coagulability of the blood within the pleura, and the definitive causes have not yet been satisfactorily solved. There is frequently a lesion of an intercostal artery in connection with fracture of an overlying rib, and the author refers to the action of the lung in producing or aggravating hæmothorax which is the actual and frequent consequence of this arterial lesion.

In 5 cases suppuration ensued as a complication of hæmothorax: 2 empyemas, 1 encysted pleurisy, 1 pulmonary abscess, 1 posterior mediastinal abscess. Four of these cases were successfully operated upon. Of the total 28 cases, 19 recovered and 9 died.

From his study of the 28 cases the author recommends the following treatment: (1) Absolute rest in the semirecumbent position, endeavoring to attenuate the thoracic pains by injections of 0.5 to 1 centigram of morphine; stimulants such as camphorated caffeine oil every 4 to 6 hours being given; (2) liquid food; to disinfection of the wound, which is opened without probing; (4) when hæmo-

thorax is so considerable as to cause displacement of the heart and dyspnoea, thoracentesis is done, keeping uniformly to Dienlafoy's precept of extracting only 500 ccm. of blood at a time, repeating as frequently as necessary; (5) if the thoracic fluid becomes purulent a rib resection should be done; (6) careful intervention with pneumotomy should be done in the accessible parts of the lung.

Regarding ligature of the intercostal artery, in order to arrest hæmorrhage it is necessary to make repeated trials before accepting or condemning it definitely, as it is not possible to draw general conclusions from single cases. There is no hope that by improving the technique pneumothorax may be avoided.

W. A. BRENNAN.

Fort, R. 1e: Technique of the Extraction of Foreign Bodies in the Mediastinum, by the Transpleural Route with an Anterior Costal Opening and Other Methods; Operative Results (*Technique de l'extraction des corps étrangers du médiastin; de la voie transpleurale par volet antérieur à charnière externe et de quelques autres procédés; résultats opératoires*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 26.

The surgical rule of the present day is to extract projectiles from the lung, and allow those of the mediastinum to remain. But projectiles of the lung which become encysted are often well tolerated and are infinitely less dangerous than those of the mediastinum situated near the heart and large vessels and which are always moving in the midst of delicate organs.

For many reasons surgery of the mediastinum is not well established. The occasions for practice are rare; published observations and cadaver experiments do not give much help; the routes of approach are difficult and interventions are reputed to be very dangerous.

Le Fort's object in making this report is to give a precise technique supported by integral statistics which demonstrate that a well-conducted operation is not very serious. It is indispensable that such surgery should be undertaken only by experienced operators.

Le Fort's experience is based on 30 operations in the three following groups:

1. Operations on the mediastinum for abscess, thymic tumors, stab wounds, etc.
2. Operations undertaken for the extraction of foreign bodies, but which proved to be situated outside the mediastinal pleura.
3. Operation for extraction of foreign bodies which were situated between the right mediastinal pleura and the left mediastinal wound or intramediastinally.

The best method of approach in the majority of cases is the anterior transpleural route through a costal opening. The route remains good in case of a projectile deemed to be mediastinal but which in reality is situated in the pleural cavity or in the pulmonary parenchyma.

Before intervention, except for urgency, cicatriza-

tion of anterior thoracic wounds must be awaited. Le Fort gives the full details of his method of extraction of foreign bodies by this route removing a costal flap. This includes the selection of the side of the thorax, the ribs included in the flap; the cutting of the flap; mediastinal liberations; search for the foreign body; and extraction with closure of the wound.

Pneumothorax is remarkably well supported and there does not appear to be much more inconvenience in a large opening of the pleura than of the peritoneum. Flattening of the lung against the vertebral column in pleural incisions is only a fable; it occurs only in the cadaver. It is not necessary to puncture in order to extract air remaining in the wound after operation. Le Fort has not done it in any of his cases. The efforts of the patient will drive out in part any air remaining in the cellular tissues.

But this method of operation by anterior costal flap is not the only one to be recommended; there are other methods for which there may be formal indications, viz.:

1. Simple intercostal incisions with or without a limited resection of one rib (for foreign bodies easily reached).

2. Anterolateral transpleural route with large resection of the sixth rib. This provides ample opening of the inferior mediastinal zone and of the diaphragm.

3. Posterior transpleural route, which gives access, limited to the aorta, brachiocephalic trunk, etc.

4. Extrapleural route. By this route access can be obtained to foreign bodies situated in front of the two first dorsal vertebræ.

The approach varies for the anterior and posterior mediastinum.

Le Fort calls attention to the absolute necessity of a complete radiologic study before any intervention. This will give the geometric localization of the foreign body; the anatomic localization and the relations to the surrounding organs; the physiological localization movements communicated from the heart, diaphragm, and vessels.

Le Fort expects soon to publish all the details of his interventions of the various kinds enumerated. He gives a short account of 15 operations for the extraction of intramediastinal projectiles, with only one death. In 14 of these cases the foreign body was extracted. The postoperative course was as a rule simple.

In the discussion following the paper opinions were divided. Those who criticized 'Le Fort's' procedure expressed the opinion that the costal resection should be limited to a single rib.

W. A. BRENNAN.

Binet and Masmonteil: Extraction of Intrathoracic Projectiles (*L'extraction des projectiles intrathoraciques*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 78.

The difficulties met with in the extraction of mediastinal projectiles have been exposed in a

recent report by Le Fort. The authors in 107 cases found 15 intrathoracic projectiles — excluding intrapleural, intrapulmonary, and intracardiac. Of these, 7 were mediastinal, 5 being anterior and 2 posterior mediastinal projectiles; 3 were juxta-cardiac in contact with the pericardium. The majority were small pieces of shell.

The authors studied in detail the route of approach on the mediastinum. When the projectile is seen radioscopically above the third rib, in front and above the fifth spinous process behind, they approach it by the anterior route. Below this zone which corresponds to the pulmonary hilum they prefer a lateroposterior incision. Foreign bodies included in the diaphragm can be reached by a thoraco-abdominal incision.

The superficial or deep position of the projectile rather than other circumstances determines the method of excision. The authors reserve the thoracic flap for cases where the foreign body is in a dangerous zone in the vicinity of large vessels, in which case it is necessary to have a full and clear field of observation so that grave accidents may be avoided. They agree with Le Fort that for the upper mediastinum large rib resections comprising the second, third, and fourth ribs, and for the lower mediastinum, the third, fourth, and fifth ribs, are desirable. The pleura should not be exposed unless necessary, but if necessary it should be fully opened up without fear of any resulting pneumothorax, the dangers of which have been greatly exaggerated.

All cases operated upon by the authors have recovered and primary union has been obtained in all cases except one.

W. A. BRENNAN.

TRACHEA AND LUNGS

Moure, E. J., and Conuyt, G.: War Wounds of the Larynx and Trachea (Les plaies de guerre du larynx et de la trachée). *Rev. de chir.*, 1916, xxxv, 11 sem., 1.

Military statistics show that laryngotracheal injuries are not frequent. In the present war only an approximate percentage has been established. Wounds of the neck may be taken as about 3 per cent of the total wounds. In an experience with several thousand wounded the authors have found only about 30 wounds of the larynx and trachea.

They class laryngotracheal injuries as (1) neuropathic disturbances, (2) extrinsic or extralaryngeal lesions, and (3) lesions of the laryngotracheal region.

In the second category the authors give some clinical examples of nerve and muscle lesions and lesions involving the œsophagus. In the third category are lesions of the laryngeal region (cartilage, muscles, articulations, and ligaments), of the cricoid, epiglottis, and trachea.

The immediate results of laryngotracheal injuries are hæmorrhage, emphysema, asphyxia, and sudden death. In the great majority of cases of penetrating wounds of the laryngotracheal tract, the respira-

tion was compromised to such an extent that tracheotomy was necessary to save the life of the patient. Besides this preliminary preventive tracheotomy, the wound, as is the common practice in all war injuries, must be opened up and cleaned and foreign bodies, etc., removed. These procedures of tracheotomy and cleansing constitute the immediate treatment of such injuries.

The results consecutive to laryngotracheal injuries are classed by the authors as: (1) œdema of the laryngeal mucosa; (2) suppurations; (3) inflammatory stenoses; (4) paralyses. Such results may necessitate a second tracheotomy. This should be systematically performed. Inter-cricothyroidean laryngotomy ought never be done, according to the opinion of the authors.

A large portion of the author's extensive article is devoted to a detailed study of laryngotracheal cicatricial stenoses, including (1) circular or membranous stenoses; (2) tubular stenoses; (3) complications, perichondritis, etc; and the treatment by tracheolaryngostomy including their special technique.

Only when the surgeon is quite assured that cicatricial retraction has terminated and that laryngotracheal permeability is perfect should any plastic procedures be attempted.

The authors describe the detailed technique of Moure's special laryngotracheal autoplasty. This consists in making two cutaneous flaps around the laryngotracheal opening which superimpose on each other so as to form a double layer over the opening.

In concluding the authors state that the cicatricial laryngeal stenoses of war are quite different from those observed in peace and the prognosis is much more serious. The article appears to be well worth careful study by laryngologists.

W. A. BRENNAN.

Tecon and Aimard: Comparative Gravity of Left and Right Pulmonary Tuberculosis Location (Gravité comparée des localisations tuberculeuses pulmonaires gauches et droites). *Rev. méd. de la Suisse Rom.*, 1917, xxxvii, 45.

In studying the statistics of artificial pneumothorax, the authors were impressed by the fact that the great majority of these had been done on the left lung, the proportion being 61 per cent for the left and 29 per cent for the right lung. Reviewing the literature the authors find this fact verified in other reports. They have studied the observations of 2,000 cases of pulmonary tuberculosis at Leysin, averaging 30 years of age. There were 1,342 men and 658 women.

Dividing these cases into 3 groups: There were 516 patients in the first group, in which recovery was the usual result. There were 142 with tuberculosis of the left lung with 83 per cent of recoveries. There were 374 cases of tuberculosis of the right lung, of which only 7.5 per cent were cured.

In the cases in the second group in which the presence of the Koch bacillus was verified in the

expectoration, there were 1,052 patients. Of these, 472 had a left lung location, with 7 per cent deaths, 53 per cent ameliorations, and 11 per cent cured. There were 580 cases of tuberculosis of the right lung with 3 per cent of deaths, 63 per cent amelioration, and 16 per cent of recoveries.

In the cases in the third group, there were two categories. The first included all non-cavitary patients; all cavernous tubercular cases comprise the second. The first category consists of 109 patients, 64 with left and 45 with right side lesions. Of the 64 left-side cases there were 44 per cent deaths, 17 per cent amelioration, and 4 per cent recoveries. Of the 45 right-side cases 55 per cent are dead, 6 per cent were ameliorated, none recovered.

In the cavitary cases there were 323 patients, 205 being left-sided and 118 right-sided lesions. The 205 left-sided cases gave 38 per cent deaths, 10 per cent amelioration, and 2 per cent recoveries. The right-sided cases gave 27 per cent deaths, 32 per cent ameliorations, and 6 per cent recoveries.

The authors conclude from their statistics that a left-sided tuberculosis is more grave than a right-sided one, and requires a more reserved prognosis.

W. A. BRENNAN.

Jacobæus, H. C., and Key, E.: Some Experiences with Operative Intervention in Lung Tuberculosis (Einige Erfahrungen von operativen Eingriffen bei Lungentuberkulose). *Nord. med. Ark.*, Stockholm, 1916, xlix, *Kirurgi*, No. 15.

The authors publish their joint experiences with different methods of surgical intervention in the treatment of pulmonary tuberculosis.

The methods applied by the authors are designed to bring about collapse of the diseased lung. Many of the cases were in such a condition that complete collapse of the lung after induction of pneumothorax was found to be prevented by adhesions. Two different methods, or modifications of them, are employed. One is the endopleural cauterization method, introduced by Jacobæus, for the burning off of stringy adhesions; the other is the thoracoplastic method of Sauerbruch, as executed by Key.

The cases are divided into three groups: (1) cauterization of adhesions, (2) scaling out insertion of adhesions, and (3) thoracoplasty.

In this report only the cases of cauterization are given; the cases treated by other methods will be described later. Up to November, 1915, including 3 trial operations there were 9 cases treated by cauterization of adhesions. Since then 8 others have been carried out; but in 2 of these which were border cases, cauterization did not give the desired result and wider surgical intervention was necessary.

The authors give the full clinical details of the last cases, illustrated by roentgenograms. The technique differs only in slight details from that previously described. The patient lies on the healthy side with a pillow under the arm in order to have the affected side as convex as possible. Incision for

insertion of the thoracoscope is made toward the back, higher or lower according as the adhesions are situated toward the apex or middle of the lung. Incision for the galvanocautery is usually made laterally in the axillary region. The cautery is introduced where the adhesions can be located by the thoracoscope. Generally there is no great difficulty in reaching the adhesions. In the technique of burning off the adhesions which the authors describe, if the degree of heat is too great hæmorrhages may occur; if too weak, tissues may cling to the platinum, causing pain to the patient on each movement of the cautery. Hæmorrhage generally does not give trouble and is easily controlled. The authors describe a special puncture needle for direct anæsthesia of the adhesions, under the control of the thoracoscope, which is more satisfactory than anæsthesia from without the chest wall.

Although the cauterization of lung adhesions is still in the developmental stage, yet comparing later results with those already reported, the most essential new fact is that not alone were more or less thickened, ropy adhesions removed, but also membranes 10 to 15 cm. wide, without causing serious complications, and with favorable results in many cases.

There are several possible complications, hæmorrhage, septic empyema (due to opening of cavities during the cauterization), etc., but the authors do not believe that they appear so often as to cause great risk. Where there is an existing or developed pleuritis during operation complications may result and in one of the cases tuberculous empyema did result; but this means that the time of operation must be carefully chosen with regard to pleuritis.

Air embolism does not usually occur. In the cauterization the vessels become thrombosed which avoids the danger. Pleural shock may occur but the danger of such is slight.

Of the 15 cases included in this series, 3 were trial cases, where no results could be hoped from any intervention. These cases died and should not be included in judging results. Six cases show such a strikingly improved condition that future recovery may be hoped for. Two cases have died.

W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Gaudier, H.: Wound of the Heart with Bullet Remaining Fixed in Left Ventricle; Almost Complete Absence of Cardiac Reaction; Operative Intervention (Plaie du cœur par balle restée fixée dans l'épaisseur du ventricule gauche; absence presque complète de réaction cardiaque; intervention opératoire). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 339.

The case is reported of a soldier, who was wounded and remained unconscious on the battle field for an indefinite time after which he awoke and walked toward his lines and was picked up by some comrades. The wound was in the left parietal region.

He remained under care with varying symptoms for about three months when a radioscopic examination showed that a bullet was lodged transversely about the level of the heart apex parallel to the diaphragm and following all the movements of the left ventricle. A semicircumferential incision 20 cm. long was made, starting from the sixth intercostal space on the mammary line and ascending to the third on the same line; the third and fourth costal cartilages were sectioned; giving a wide flap, the pleura was incised; incision of the pericardiac sac over the ventricles was incised and adhesions freed with the finger. The heart was held in the left hand and brought outside of the pericardium, and a bulge was observed in the anterior wall of the left ventricle. This was found to be due to the embedded projectile which was extracted. The pericardium, costal flap, and intercostal muscles were sutured with catgut, followed by pleural drainage. The intervention lasted 30 minutes. Respiration was good and the pulse varied from 60 to 80. The postoperative course was without serious complications and the man was able to leave the hospital in less than three weeks.

W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Yankauer, S.: Experiences in Œsophagoscopy.
Am. J. Surg., 1917, xxxi, 53.

Assuming that the œsophagoscopist is one who is thoroughly familiar with the anatomy of the throat and œsophagus; accustomed to handling these parts in the living; that he possesses the keen insight, steady hand, and manual dexterity which constitute technical skill, œsophagoscopy is not a dangerous procedure. It is always performed with some definite object in view and the dangers which are often ascribed to this manipulation are due to the nature of the case and the operative procedures which must be performed with its aid, so that

œsophagoscopy in individual instances may be a dangerous procedure.

Œsophagoscopy is performed for the removal of foreign bodies or for the diagnosis and treatment of œsophageal disease.

ELLEN J. PATTERSON.

Sarmiento, F. de Maraes: Clinical Observations on a Series of 172 Cases of Cancer of Œsophagus and of the Cardia (Quelques notions cliniques sur une statistique de 172 cas de cancers de l'œsophage et du cardia). *Arch. d. mal. de l'appareil digest.*, Par., 1916, ix, 71.

The author reports that out of 8,397 patients examined in Mathieu's clinic during the past six years there were 147 cases of œsophageal cancer and 25 cases of cancer of the cardia. Only 25 of the 172 cases were in females. The location was distributed as follows:

Œsophagus — 25 cases in upper third.
Œsophagus — 73 cases in middle third.
Œsophagus — 49 cases in lower third.
Cardia — 25 cases.

Ganglionic involvement is frequent but extension to other viscera is rare.

Diagnosis can be established by radioscopy and œsophagoscopy. The radioscopic signs deduced from the test-meal examination of 142 cases are: (1) a permanent stoppage of the bismuth varying according to the degree of the obstruction, in the œsophagus; (2) a more or less marked dilatation, sometimes rather slight, above the stenosed part; (3) presence of dilatation more or less fusiform not exceeding the width of four fingers followed by a narrow rectilinear or sinuous passage.

Early and progressive dysphagia is the most important and frequent symptom of œsophageal cancer. As a general rule the disease is progressive and fatal within a year after the appearance of dysphagia.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Ross, G. G., and Mencke, J. B.: Some Facts and Fallacies Concerning Abdominal Adhesions and Bands. *Am. J. M. Sc.*, 1917, cliii, 261.

A great deal of confusion which exists concerning abdominal adhesions, bands, or membranes may be obviated by the clearer grasp of certain fundamentals and an effort to distinguish between various groups and varieties of these structures, instead of attempting to make one theory explain every case.

Abdominal bands and adhesions are either the result of a definite peritonitis of more or less severity or those in which some doubt may be entertained as to their formation being the result of peritonitis. It is this latter group that forms the basis of discus-

sion at present and is divided into those bands whose character and location would presuppose a foetal maldevelopment and those where this is not so evident.

Both these groups have been explained as due to failure of rotation or descent of the gut or an anomalous growth of peritoneum and mesentery in the presence of normal rotation. This explanation the authors are inclined to doubt in view of the experiments of Eastman, Murphy, and others.

Again, Lane's theory of these bands as "crystallization of lines of force" is considered as rather vague and fanciful and without supporting grounds.

Finally, the explanation is advanced that all bands are results of inflammation either ante- or postnatal. The authors are inclined to this view

deeming antenatal peritonitis proved by the reports of Doran, Keith, Ballantyre, and Veszpremit, and that whereas many of these adhesions are to be considered congenital they are not developmental in origin.

At best, the fact remains that no two clinicians or experimenters agree on the true explanation of these bands and adhesions. Also, that while our diagnostic skill with these bands is continuously progressing our ability to deal effectually with them remains more or less dormant. P. M. CHASE.

Torres, E. M.: Treatment of Abdominal Wounds (Tratamiento de las heridas del abdomen). *Prog. clin.*, Madrid., 1917, v, 18.

The author gives a synthetic review of the treatment of abdominal wounds as reported by various operators since the beginning of the European War, and draws the following conclusions:

1. In the present war abdominal wounds are more severe than in previous wars, which is due to two factors: (1) the employment of large caliber artillery; and (2) the short range at which, in trench warfare, rifles and machine guns are fired.

2. The theory of the frequency of spontaneous recovery of abdominal wounds is based on old conceptions and statistics not very well interpreted, and at any rate inapplicable in the present war.

3. Systematic abstention as a treatment of choice in this class of wounds is a dangerous practice.

4. Intervention, as early and as completely as possible, should be the rule when the surgeon has the requisite facilities at his disposal.

W. A. BRENNAN.

Schoene, G.: The Indications for the Surgical Treatment of Peritonitis. *Deutsche Ztschr. f. Chir.*, 1916, CXXXV, H. 6.

Schoene discusses the dry and lavage treatment of peritonitis. What are the indications for one or the other method? According to the author lavage is indicated in primary generalized peritonitis (appendiceal, pneumococcal, or traumatic intestinal lesions) or in peritonitis not yet generalized but rapidly progressive. Lavage is not indicated in peritonitis generalized secondarily to a circumscribed peritonitis while there is a possibility of excluding such a circumscribed focus by a tamponade from the rest of the abdominal cavity. Lavage is never indicated in cases of multiple abscesses more or less encysted and dependent on different germs; nor in cases of advanced peritonitis. W. A. BRENNAN.

Carson, N. B.: Papilloma of the Umbilicus. *Ann. Surg.*, Phila., 1917, LXV, 199.

According to Cullen, who has made an exhaustive study of the umbilicus and its diseases, there are only seven well authenticated cases of papilloma of the umbilicus in the literature. Most of the tumors have been noted between the twenty-fifth and fiftieth

years, although Broussolle reports one in a child five months old. They are, as a rule, pedunculated, although in one case the growth spread out upon the abdominal wall. They are slow in growth, varying from 5 mm. to 3 cm. in diameter. They are said to occur most often in individuals of filthy habits. According to Cullen "in the ordinary umbilical papilloma the growth is caused by a proliferation of the stroma—the squamous epithelium covering the papillæ occupies merely a passive rôle."

The author reports one case of papilloma of the umbilicus which occurred in a man twenty-seven years old. The tumor was removed under local anæsthesia. It was 2 cm. in diameter. Sections of the tumor showed papillæ flattened on top as if by pressure. The entire surface was covered with a number of layers of unbroken epithelium. The papillæ themselves were enlarged and swollen and extended down into the underlying connective tissue which showed a highly inflammatory process. The papillæ themselves were infiltrated with a large number of small round cells between the epithelial cells, many of which were eosinophiles, though some polymorphonuclears were present. GATEWOOD.

Schachner, A.: The Causes, Prevention, and Operative Cure of Herniæ. *Internat. J. Surg.*, 1917, XXX, 45.

Postoperative herniæ can usually be prevented by making the incision in the median line, providing infection does not occur. Vertical incisions on either side of the median line are often followed by herniæ developing through lack of abdominal resistance to intra-abdominal pressure, the result of paralysis from division of the motor nerve. In the cure of post-operative herniæ the first step is to separate the omental and intestinal adhesions; second, remove all scar tissue along the pillars of the opening so that each structure may be individualized and restored.

Among the causes of inguinal hernia the upright position comes first. In addition, the inadequate attachment of the intestinal canal, the force of gravity, a long mesentery, and the imperfect muscular development of the inguinal region, are all of importance. To facilitate the descent of the testes a small space exists between the transversalis and the internal oblique muscles. In the herniated this space is larger than in the non-herniated, the existing condition being one of degree only.

In the treatment of the condition it is important not to leave a concavity at the hernial site, otherwise a return is possible. To improve the technique in this respect Macewen folded the inguinal sac upon itself while Kocher twisted the sac into a cord and then brought it up. The permanency of the result depends upon two factors: the thoroughness with which the sac is obliterated, and the security with which the suturing of the tissues is accomplished. The latter is accomplished by bringing the conjoined tendon downward and suturing it to the inner surface of Poupart's ligament. In the original Bassini operation the cord was transplanted, but

Coley, Girard, Ferguson, and Andrews have all modified this technique.

Injection of paraffin or of Morton's fluid is a failure. The use of a truss is indicated in the herniæ of children two years of age or under, in elderly subjects to whom it would be inadvisable to administer an anæsthetic, and in young and vigorous adults, especially with left-sided inguinal hernia of small size.

The same remarks apply to femoral as to inguinal hernia, but the cure of the former is much simpler. Ligation and removal of the sac is usually all that is necessary. With an exceedingly large femoral rupture, the Bassini principle is applied the same as in inguinal hernia. The Gordon operation is an effective procedure, also, in large femoral hernia.

The treatment of umbilical hernia, to be satisfactory, depends upon the use of the overlapping method of suture, as applied by Mayo.

E. K. ARMSTRONG.

Ochsner, A. J.: Hernia in Children. *Surg. Clin.,* Chicago, 1917, i, 71.

Ochsner states that only 7 per cent of herniæ in children require operative treatment. He states that Malaigne 60 years ago found by examining children of school age and then again at military age that 73 per cent recovered without treatment.

In the operative procedure great care must be exerted to avoid trauma to the spermatic cord, because of the liability of resulting testicular atrophy.

His conclusions follow:

1. The development of herniæ in children is favored by: (1) faulty development of the abdominal wall; (2) insufficient strength in the tissues involved in closing the umbilical, inguinal, or femoral openings; (3) abnormal intra-abdominal pressure; (4) patency of the tunica vaginalis.

2. The first and second conditions are frequently inherited.

3. The abnormal intra-abdominal pressure is due: (1) to gaseous distention resulting from improper feeding; (2) to the exertion necessary to evacuate the bladder on account of obstruction due to phimosis; (3) to severe, long-continued coughs; (4) to vomiting; (5) rarely to traumatism or overexertion.

4. Approximately 95 per cent of all cases of hernia in children will heal spontaneously if the abnormal intra-abdominal pressure is relieved and the hernial sac is kept empty.

5. This can be accomplished by means of trusses, or much more rapidly in inguinal and femoral hernia by placing the child in bed with the foot of the bed elevated; the time required usually does not exceed six weeks, and in most cases the hernia will heal upon relieving the abnormal intra-abdominal pressure and simply placing the child in bed with the foot of the bed elevated from 6 p. m. each night to 8 a. m. the following morning for several months.

6. Children with a tendency to the formation of hernia should be guarded against developing coughs.

7. The diet should be given at regular times and chosen with a view to avoiding gaseous distention.

8. Constipation should be entirely prevented.

9. In boys phimosis should be relieved, if present, by operation.

10. Badly nourished and badly cared for children of the poor should be treated in hospitals, being placed in bed in the Trendelenburg position, the intra-abdominal pressure being relieved by proper diet and treatment.

11. Operation is indicated: (1) in strangulated hernia; (2) in irreducible hernia due to adhesions; (3) in case the opening is unusually large in a free hernia, especially if the condition is hereditary; (4) in reducible hydrocele; (5) in cases with undescended testicle unless they show a tendency toward spontaneous cure.

12. Except in Class 3 the operation should consist simply in carefully dissecting out the sac, or in certain cases of congenital hernia, the neck of the sac, ligating it within the abdominal cavity, cutting away the sac and permitting the stump to retract within the abdominal cavity, and closing the skin wound.

13. In Class 3 the Ferguson-Andrews operation is indicated.

14. In Class 5 the Bevan-Ferguson-Andrews operation is indicated.

15. The recumbent position, with the foot of the bed elevated, is of very great importance in the after-treatment of operative cases as well as in the non-operative treatment of herniæ in children.

16. In young children who will not remain in bed with the foot of the bed elevated this position can usually be maintained by applying rubber adhesive straps to both lower extremities and having these held in a vertical position by means of weights and pulleys.

17. If the child cannot be kept in this position, a well-fitting truss should be worn night and day until there has been no protrusion for at least six months; at the same time the necessary precautions must be constantly taken to guard against abnormal intra-abdominal pressure from any cause.

K. L. VEEH.

Handley, W. S.: Strangulated Hernia. *Practitioner.,* Lond., 1917, xcvi, 235.

The case is reported of a man, 78 years of age, who had had a left inguinal hernia for 30 years. Two days before admission, after a severe coughing spell, while lying in bed, the hernia became irreducible and complete constipation resulted. After taxis the tension was relieved but the hernia could not be reduced. Operation showed the reduced tension to be due to fluid in the sac being returned into the abdomen. Radical cure was effected.

Handley defines complete constipation as the cessation of the passage of flatus and fæces persisting for twenty-four hours or more in spite of the use of enemata. In strangulated hernia, the swelling is very tense and this is the most important local

symptom. The relief of tension in the above case is very unusual. The trend of opinion at the present day is entirely against the use of taxis, as the tumor may be reduced "*en masse*," either forcing the sac and contents to a position just behind the abdominal muscles, between the muscles and peritoneum, or the neck of the sac may rupture and the intestine pass out between the muscle and the peritoneum through this rupture.

In opening the sac if the contained fluid is clear and odorless the gut is replacable into the abdomen, while if it is blood stained, or dark and offensive, the intestine is unreturnable. If the vessels of the strangulated gut are thrombosed the coil is unreturnable. After the stricture has been divided the bowel should be brought down and examined at the point of strangulation.

Three alternatives are given if the bowel is unreturnable: (1) the damaged intestine may be left in position and a Paul's tube introduced for draining the intestine; (2) resection; (3) lateral anastomosis beyond the extremities of the injured bowel as a by-pass for the damaged coil. The gangrenous part is left in the bottom of the wound. The necrotic bowel will slough off and as the main current is via the lateral anastomosis the fistula will close itself. A secondary operation is not necessary. Handley favors this technique.

The second case reported was that of a woman, 65 years of age, with a femoral hernia of the Richter type without complete obstruction, as only part of the bowel circumference was nipped by the stricture. An ounce of pus was found in the sac. Poupart's ligament was divided upward opening into the peritoneal cavity, leaving the gangrenous part of the bowel in the wound. Poupart's ligament was then sutured. The gangrenous bowel ruptured and faecal matter was discharged through the wound for several days. After three weeks the woman was up and about.

CARL R. STEINKE.

GASTRO-INTESTINAL TRACT

Richardson, E. P.: Acute and Subacute Perforations of the Stomach and Duodenum at the Massachusetts General Hospital. *Boston M. & S. J.*, 1917, clxxvi, 158.

An analysis of 104 cases of acute and subacute perforations of the stomach and duodenum is undertaken with a view of considering the operative results; especial attention being paid to the advisability of a primary gastro-enterostomy as well as closure of the perforation.

In the series, 90 operations were performed and 14 considered as unfavorable; of the operated cases, 76 showed an open perforation without walling off.

Of the series, there were 43 gastric and 57 duodenal perforations; of the former 55.8 per cent were men while of the latter 94 per cent were men. The average age of the former was 33 and of the latter 33.4. The remarkable thing is the striking pre-

dominance of duodenal perforations in men. Perforation was in all instances single.

The different locations of both gastric and duodenal forms are given in tabular form. In the gastric variety the anterior wall near the pylorus and along the lesser curvature is the area of predilection, while in the duodenal a small area on the anterior superior aspect within 1 or 2 cm. of the pylorus is the point of greatest vulnerability.

An antecedent history of indigestion was more common in the gastric cases; symptoms suggestive of ulcer in 49 per cent; indefinite symptoms 36 per cent, and none 15 per cent. In duodenal cases, symptoms suggestive of ulcer 16 per cent; indefinite 54 per cent; and none 30 per cent.

Premonitory symptoms of pain, tenderness, and distress were present in a considerable number of cases and preceded perforation by three or four days.

The onset was sudden in 90 per cent. The pain, sharp and lancinating, was first local and later became diffuse; tenderness corresponded to this pain, and was referred to the right hypochondrium. In 15 per cent of the gastric cases this was in the left side.

Spasm was commonly general and most pronounced over the point of greatest tenderness. Vomiting occurred occasionally in 83 per cent, elevation of the temperature was as a rule only slight. The average leucocyte count in fatal cases was 18,500, in recoveries, 19,800. Distention of the abdomen was present only as a late development.

In diagnosis, appendicitis is most likely to be confused with duodenal cases owing to a gravitation of the fluids down the right lumbar gutter, 31 per cent of the series. The presence of a normal or only slightly damaged appendix with considerable thin, odorless fluid should suggest upper abdomen exploration.

In the series of 90 perforations operated on 32, or 35.5 per cent, died; the total mortality of the entire series of 104 cases was 44.2 per cent. Of the duodenal cases 15, or 31 per cent, died; of the gastric, 17, or 50 per cent, died. These figures are the statistics of 20 years and a table gives the mortality figures for the 5-year period. This shows a steady lowering in the duodenal cases while that of the gastric remains high. This may be due to the ease of approach and lack of necessary harmful manipulation in the former variety, as well as the fact that the contraction of the pylorus would prevent largely the extravasation of gastric contents.

The chief factor, however, is the lapse of time before operation; in the duodenal cases recovering it was 14 hours; in the fatal cases 25 hours; in the gastric cases recovering 17 hours; and in the fatal cases 19 hours. These are cases of diffuse peritonitis only. In the inoperable cases the average time before death was 32 hours.

Age is likewise an important factor. In the duodenal cases recovering the average age was 36; of those dying, 50. In the gastric cases recovering the average age was 32; of those dying, 51.

The principal cause of death in all cases was peritonitis. Subdiaphragmatic abscess developed in 25 per cent of the fatal cases.

Of the cases with diffuse peritonitis, 70 were treated by closure or drainage alone and 12 had a posterior gastro-enterostomy added; of the latter only 2 died. Cases treated by drainage or packing without suture showed the highest mortality.

General saline irrigation of the abdomen was used in the earlier cases and is not recommended as a routine measure. In 35 cases, 7 showed a growth from peritoneal fluid and 28 none.

As far as immediate results are concerned gastro-enterostomy is non-essential. As for late results statistics from recovered cases which are quoted in detail show that about one-half the cases without gastro-enterostomy report no symptoms and, while this added procedure might have avoided some of the secondary operations in the other half, it is well to be conservative in adding a method of treatment which prolongs considerably the time of primary operation. From this series the contra-indications for gastro-enterostomy seem to be: (1) definite gastric ulcers; (2) perforated duodenal ulcers beyond middle age; and (3) in any case where there is the least question as to the resistance to peritoneal infection.

In conclusion Richardson notes the following points:

1. This series gives no evidence that pyloric obstruction is a factor increasing the primary mortality which might be avoided by an immediate gastro-enterostomy.

2. Gastric perforations carry a distinctly higher mortality than duodenal.

3. The mortality of both gastric and duodenal perforations is high after middle life.

4. One-half of the cases of perforation, treated by suture alone, were apparently cured following operation.

Therefore, an additional gastro-enterostomy may well be avoided in cases of gastric perforation in patients beyond middle life, and in any case where the general condition or lapse of time since perforation suggests possible death from peritonitis.

This series suggests, that for the average surgeon, at least, the rule should be to close the perforation, and the exception to add a gastro-enterostomy.

P. M. CHASE.

Field, M. T.: Obliteration of Liver Dullness in Acute Perforation of the Stomach and Duodenum. *Boston M. & S. J.*, 1917, clxxvi, 60.

Although the average perforation presents a typical picture and one that is easy to interpret — history of stomach disorders, then sudden, severe pain in the epigastrium, immediately followed by signs of spreading peritonitis which manifests itself by general tenderness and boardlike muscular rigidity, the points of maximum tenderness being usually in the epigastrium and over the iliac fossæ, especially on the right side, and this classical pic-

ture, when present, requires no further aid to diagnosis — all cases are not so typical.

The history of indigestion may be absent; the pain may not be so severe; and still more important, the rigidity may not be boardlike and general. In these cases, any available sign that may aid in arriving at a diagnosis, is worthy of consideration.

The author believes that while there is no doubt that the older writers laid too much emphasis on the value of the obliteration of the liver dullness as a diagnostic sign in acute perforations of the gastro-intestinal tract, considering it almost a *sine qua non*, at the present time this sign is not given the consideration it deserves. In support of the present skepticism, as regards the occurrence of this finding, he quotes Mayo Robson, C. L. Gibson, A. D. Bevan, Cubbins, and Deaver, some of whom state that they never see this sign, while others find it only in cases seen very late, and consider the sign of no practical importance, and believe it should no longer be considered.

The author, however, believes that it possesses real value, and that it is worthy of consideration and study, and that it may occur even in the presence of boardlike rigidity and a retracted abdomen. To prove this, he submits reports of two cases, both seen early, with boardlike rigidity, and both with obliteration of liver dullness. Both patients were operated upon and recovered.

His conclusions follow:

1. The diagnosis of acute perforation can generally be made without the demonstration of free air in the peritoneal cavity, obliterating the liver dullness.

2. In a certain percentage of cases, this sign may be a valuable aid to diagnosis.

3. Absence of liver dullness may be present early and with a rigid and retracted abdomen.

4. Instead of eliminating this sign as a diagnostic possibility, it should be given the consideration and study it deserves — and only that.

DAVID C. STRAUS.

Tagliavacche, N.: Gaseous Subphrenic Abscess and Splenic Abscess Consecutive to a Perforated Stomach Cancer (Absceso subfrenico gaseoso y absceso del bazo consecutivo a un cancer perforado del estomago) *Prensa méd. argent.*, 1916, iii, 2 sem., 217.

Tagliavacche's patient was a man of 28 years. The disease commenced three months previous, with pains in the left hypochondrium, intermittent at first and later on constant. There was no vomiting. A tumor was palpable in the left hypochondrium. Radioscopy showed the left diaphragmatic dome somewhat higher than the opposite side and in the lower part of the hæmothorax of the same side a collection of fluid.

Laparotomy was done and the mass punctured. The following day the mass was extirpated, gas and pus escaping. The patient showed no improvement, developed a subicteric tint, and died a little later.

Autopsy showed the existence of a perforated gastric cancer and a gaseous subphrenic abscess. The author notes that abscesses of this kind are generally consecutive to ulcer. In this case the location was perisplenic. W. A. BRENNAN.

Cole, L. G.: Indications for Surgical Intervention in Gastric Cancer. *Am. J. Roentgenol.*, 1917, iv, 81.

The method, scope, and accuracy of the roentgen diagnosis of gastric cancer and the value of the negative diagnosis of such lesions have been considered many times previously, but the author now goes a step farther and considers the question of surgical procedure in cases where a positive diagnosis of gastric cancer, or a lesion that can be proved non-malignant only by microscopic examination after its removal, has been made.

To avoid misunderstandings Cole defines his statement "roentgen indications for surgical procedure" as meaning that the pathological process diagnosed is amenable to surgical procedure, either for surgical cure or palliation, regardless of the condition of the patient. He calls attention to the fact that in an individual case, the roentgen indications for surgical treatment are very definite, yet the physical condition of the patient from concomitant disease such as tuberculosis, nephritis, high blood-pressure, old age, etc., contra-indicates surgical procedure, so that the roentgen indications for surgery, although present, can not be followed. He therefore urges the importance, before following the roentgen indications for surgery, of having the combined opinion of the clinician, who knows the physical condition of the patient, the roentgenologist who knows the extent and location of the lesion, and the surgeon who should know both of these and his own ability and limitations.

If the growth is annular, involving only a comparatively small portion of the pyloric end of the stomach, an attempt at pylorotomy should be made. If extensive glandular involvement is found, a gastro-enterostomy should be done.

If there is an indurated area, with multiple nodules, involving a portion of the lesser curvature, excision should undoubtedly be done.

If the growth is too extensive for complete removal, and involves the pyloric end of the stomach causing a stenosis, with resulting gastric retention, and if there is a sufficient area of the stomach wall uninvolved to permit the surgeon to perform a gastro-enterostomy, such a procedure should be undertaken for palliation.

If a large portion of the lesser curvature is involved, or if even a relatively small area near the cardia is involved, the surgical procedure is so difficult and the mortality in these cases so high, that it should be attempted only after due consideration has been given these facts, and only by those thoroughly capable of performing this radical operation. In these cases, gastrostomy would be indicat-

ed for its palliative effects, if the tumor growth involved the cardiac orifice.

The roentgen findings and conclusions in fifteen cases are cited, with illustrative roentgenograms.

The author's conclusions are as follows:

1. In one-half of the cases the disease has progressed to such a stage, even before roentgen examination, that nothing can be accomplished by surgical intervention either for palliation or cure.

2. In the other half of the cases, 75 per cent may obtain palliation by surgical procedure, and in only 25 per cent of these cases, or only 12 per cent of the cases diagnosed by roentgen examination, should surgical procedure for cure be attempted. In 70 per cent of these few cases in which attempt was made to remove the growth, the patient died in the hospital. W. A. EVANS.

Oettinger, W., and Marie, P. L.: A Case of Polypous Carcinoma of the Stomach (Sur un cas de carcinome polypeux de l'estomac). *Arch. d. mal. de l'appar. digest.*, 1917, ix, 18.

Epithelioma of the stomach may show many different aspects, but the case observed by the authors is very rare, inasmuch as the tumor was completely separated from the gastric wall and was pedunculated, thus constituting an enormous intrastomachal polyp. The case occurred in a man of 48, whose health had always been good up to a few months before operation, when he suddenly became unconscious and a little later vomited about a liter of black and semicoagulated blood. Examination, which included radiography, owing to the absence of definite symptoms, suggested hæmatemesis with a commencing liver cirrhosis; but subsequently a diagnosis of gastric cancer was arrived at. Laparotomy and anterior gastrotomy were performed and the tumor with appendages enucleated. It was attached to the lesser curvature by a pedicle about as thick as the index-finger. The man recovered and was in excellent health one and a half years later.

The tumor was the size of a large mandarin orange and weighed 134 grams. It consisted of two lobes separated by a deep fissure in which the pedicle was situated. There was no sign of ulceration. The tumor was firm and on section it showed a whitish yellow color. Although the macroscopic appearance suggested sarcoma, histological study showed that the tumor was a carcinoma of great malignancy. The fact that it was pedunculated and formed an intrastomachal polyp was an anatomic rarity. The authors' researches have revealed only two other cases of this kind in the literature. It is their belief that the tumor was developed by the transformation of a gastric polyadenoma into cancer, but it is impossible to establish this with certainty although the existence of a small fibrous focus at the base of the tumor developed at the expense of the submucous suggests fibrous polyadenoma. No trace of tissue persisted showing the structure of an original adenoma.

The authors point out that neither the physical nor the radiologic examination in this case helped the diagnosis; and that it was only by examination of the gastric juice which showed complete aepsia, and the existence of abundant occult hæmorrhage in the stool that they were able to arrive at the diagnosis of gastric cancer.

W. A. BRENNAN.

Flint, J. M.: The Healing of Gastro-intestinal Anastomoses. *Ann. Surg., Phila., 1917, lxx, 202.*

Flint in this paper publishes for the first time an account of his observations made in 1905 while working out a method of aseptic intestinal anastomosis, together with a careful histological study of a series of gastro-enterostomies which were performed during his course of experiments. The results of his observations may be summarized as follows:

The healing of gastro-enterostomies may, in parts of the anastomosis, take place by what, as the author states, we are accustomed to call "first intention," that is to say, with a minimum of inflammatory reaction. This occurs when there has been only a slight interference with the circulation of the gastric and intestinal mucosa.

The more usual and slower method of healing occurred when there had been more or less interference with the circulation of the mucous membrane of the stomach and intestine. In these instances there was also an immediate union of the serous surfaces, which was accompanied by an exudate along the entire line of incision. A period of destruction then intervened, involving those portions of the mucosa which had had their circulation injured or destroyed. This lasted from three to seven days, depending upon the extent of the injury. In the meantime the organization of the exudate had been progressing. As soon as the destruction of the poorly nourished parts was complete, the period of restoration was inaugurated. This consisted in repair of the injured mucosa and regeneration of the mucous membrane over the exudate forming the defect between the stomach and intestine. This was usually complete in fourteen days. At the same time, the regeneration of the muscularis mucosæ and of the tunica muscularis was in progress.

The regeneration of the intestinal mucosa took place from the crypts, which, in the neighborhood of the exudate, had returned to their embryonic form. From these crypts the epithelium flattened as it passed up on to the exudate, where it often penetrated its substance and formed a single layer of squamous cells. From this layer young crypts extended down into the organizing exudate and there produced new growing centers.

The regeneration of the gastric mucosa generally began from the less differentiated epithelium about the mouths of the gastric glands or from tubules that had returned to their embryonic form. As in the intestine, the new formed epithelium flattened as it passed up on the exudate, which it often penetrated as the extremity was reached. From this sheet of epithelium, new tubules were produced

by invaginating into the substance of the exudate, which had the characteristic of embryonic glands.

The muscularis mucosæ began to regenerate about the second week. It might be repaired from its cut ends or might be, in part, compensated for by means of muscle tissue derived from the severed ends of the tunica muscularis of either the intestine or the stomach. Tearing of this layer or failure of the layer to regenerate allowed the crypts of the intestine to grow into the submucosa. At times these growths also occurred at the site of the incision and penetrated for some distance into the submucosa and muscularis.

At times the tunica muscularis did not regenerate at all, the infolded muscular layers being held together by new formed connective tissue. In other instances there was considerable regeneration of the muscular layers.

After the gastro-enterostomy there was no modification of the intestinal epithelium. The cells appeared perfectly normal. Furthermore the intestine healed normally in the presence of the gastric juice.

The clinical bearing of these studies, as the author states, emphasizes the fact that it is well for us to know not only the reaction of the stomach and intestine to the operative traumatism inflicted in performing a gastro-enterostomy but also the reparative process through which the organs pass during the period of healing. One should remember, he says, that the new formed anastomosis is the site of a healing ulcerated surface for a period of fourteen days and that, for the first five or seven days, the process is largely destructive, at least so far as the mucosa is concerned. He further emphasizes that this fact should not be lost sight of in feeding these cases for the first two weeks, during which period the diet should be as light as is compatible with the maintenance of the strength of the patient.

GEORGE E. BEILBY.

Urrutia, L.: Acute Pyloric Stenosis Consecutive to the Ingestion of Trichloracetic Acid (Un caso de estenosis pilórica aguda consecutiva a la ingestión de ácido tricloracético). *Rev. Ibero-Am. de cien. méd., Madrid, 1916, xxxvi, 492.*

Ingestion of corrosive liquids, especially acids, usually determines simultaneous lesions of the œsophagus and stomach with complete integrity of the intestine, although in some cases there are duodenal and jejunal lesions. When death does not immediately result from the ingestion, it is very often observed after a relatively calm period of a few weeks that symptoms of œsophageal or pyloric stenosis may appear.

The author relates such a case in a child of five years to whom some trichloracetic acid had been accidentally administered. Three weeks later the symptoms led to a diagnosis of pyloric stenosis. On operation the pylorus was found adherent to neighboring organs and greatly indurated with all the antrum region of gelatinous aspect. The anterior

surface of the stomach, especially toward the fundus, showed much ecchymosis.

The author executed a retrocolic anterior gastro-enterostomy and the child made a good recovery.

W. A. BRENNAN.

Lindsey, J. H.: X-Ray Follow-Up Report of Seventeen Cases of Pylorotomy for Ulcer. *Boston M. & S. J.*, 1917, clxxvi, 80.

In this article nineteen roentgenograms are presented for study, from cases that have been under observation at the Truesdale clinic from two to seven years. The importance is realized of observing patients for a long time after operation, in order to determine the permanence of the improvement or apparent cure. The first seven cases were reported two years ago by Truesdale.

Attention is called to the difficulty of standardizing conditions at repeated gastric X-ray examinations, but the evidence presented in the study of these plates shows that after pylorotomy, the stomach tends to enlarge or dilate, in an effort to compensate for the part removed. Where a large portion of the stomach has been removed, there is, more or less, the action of a funnel and here this enlargement is not observed. Of this whole series only two cases were not benefited; and the author believes that in general the efficient manner in which these stomachs have performed their function at such long periods after operation testifies to the essential conservatism of an apparently radical operation.

W. S. NEWCOMET.

Mathieu, A., and Alivisatos, A. S.: Duodenopyloric Ulcer Giving Rise to a Tumor Situated to the Left and Above the Umbilicus (*Ulcus duodénopylorique donnant lieu à une tumeur située à gauche et audessus de l'ombilic*. *Arch. d. mal. de l'appar. digest.*, 1916, ix, 154.

The case is reported of a woman of 30 who was operated upon for duodenopyloric ulcer. Macroscopic and microscopic examination of the resected part and of the external ganglia showed no appreciable neoplastic lesion. There was perigastritis about two months after operation.

The woman came to the clinic seven years later, showing a large neoplastic tumor which appeared to have originated at the site of the pyloroduodenal resection and which led to her death.

The author thinks that the occurrence of the original tumor to the left of and above the umbilicus is noteworthy as it suggested a lesion of the small curvature rather than a pyloric or juxtapyloric lesion.

W. A. BRENNAN.

Pauchet, V.: Treatment of Duodenal Ulcer (*Traitement de l'ulcus duodenal*). *Presse méd.*, 1917, p. 41.

Pauchet says that of every ten patients who consult their physician for gastric trouble only one has a true gastric or duodenal lesion (ulcer or cancer). Of the other nine pseudogastropathies half are not gastric or duodenal and the rest are not abdominal (hepatic, renal, or cardiac affections).

He thinks that recent ulcers should be treated medically; but that chronic ulcers, or those characterized by a recurring hyperchlorhydric syndrome must be surgically dealt with. But in order that this opinion may be accepted it is necessary that the operation should be harmless. In the case of an old callous or cancerous ulcer a surgeon may justly expose a patient to a risk even up to 30 per cent, if necessary, but a duodenal ulcer calls for a harmless operation only.

Pauchet reviews the various operations in vogue for the treatment of duodenal ulcer. Since duodenal ulcer can be cured by simple anastomosis and there is no cancerous degeneration as in gastric ulcer, excision is barred on principle. Finney's operation, gastroduodenostomy, is very conservative. Gastro-enterostomy is harmless, with complementary pyloric exclusion as the best procedure.

Pauchet's technique for exclusion consists of section of the three coats of the anterior stomach wall and of the mucosa of the posterior wall. The circular ends of the mucosal section are formed into a cul-de-sac to completely isolate the gastric cavity from the duodenal cavity; the anterior seromusculature is then sutured. The posterior seromusculature is not touched. This exclusion makes an absolutely staunch barrier. Pauchet thinks that ligature of the four vessels which traverse the large and small curvatures is necessary, and when this ligature is systematically made there is very little risk of hæmorrhage.

The gastro-enterostomy is done according to the technique of Ricard and Moynihan with vertical incision in the left part of the stomach far from the pylorus. Closure is made by three rows of sutures.

In 21 operations of this kind Pauchet had one death. Of 100 old, operated cases, 75 are in a perfect state, 20 greatly improved, 5 must be re-operated.

W. A. BRENNAN.

Wagner, A.: Contribution to the Pathology, Clinical Aspect, and Surgery of Duodenojejunal Hernia. *Deutsche Ztschr. f. Chir.*, 1916, cxxxv, H 6.

Wagner reports a case of duodenojejunal hernia (Treitz' hernia) in a boy 14 years old. During the last two years the patient complained at intervals of weight in the epigastric region which was temporarily relieved by occasional biliary vomiting. Symptoms of tetanus appeared suddenly and vomiting occurred daily. The patient lost weight rapidly. His case was diagnosed as pyloric stenosis with stomach dilatation. Radioscopy with bismuth meal showed enormous duodenal dilatation due to an intestinal stenosis of unknown origin. Operation showed that there was a duodenojejunal hernia; the sac contained the lower part of the ileum to which it was partially adherent; the duodenum was dilated to the size of an adult arm and hypertrophic. The intestine freed from adhesions was extracted from the sac which was partly resected. The patient recovered.

This class of hernia seems to be more frequent in

men than women. Some are found at autopsy; some cause only slight digestive disturbances during life; others cause either chronic or acute symptoms of intestinal obstruction. Biliary vomiting with masses of mucus are frequent. Tetanus may be present as a symptom of grave intoxication.

Wagner has collected 28 cases of operated duodenojejunal hernia, 5 of which were doubtful. Of the remaining 23, 10 died and 13 recovered.

W. A. BRENNAN.

Thacher, J. S.: The Question of Operation for Suspected Perforation in Typhoid Fever. *Med. Rec.*, 1917, xci, 311.

The uncertainties of diagnosis and the hazards of surgery in suspected typhoid perforation are noted, and specimen cases are described in detail.

A curious fact has been noted by Thacher, that those cases which were refused operation when first suggested died and those operated on against advice recovered.

Two cases were operated on in a most debilitated condition, one with marked mitral lesion, pericarditis, and pleurisy, and both showed improvement even though no perforation was found.

Whitney of Philadelphia reports that every case in which perforation was suspected and in which no operation was done died, while two that were operated on and showed no perforation promptly recovered.

Deaver reported 30 cases, with 26 recoveries and 4 deaths following laparotomy; on the other hand of 10 not operated upon 9 died.

Patterson collected 26 cases of appendicitis in typhoid, operated on, but without perforation; 22 recovered and 4 died.

Thatcher believes the question may be summed up in the words of Mikulicz, thirty years ago, "If there is suspicion, don't wait for an exact diagnosis; immediately explore, for it is free from danger."

P. M. CHASE.

Gage, H., and Hunt, E. L.: Hypertrophic Ileocaecal Tuberculosis. *Boston M. & S. J.*, 1917, clxxvi, 259.

The subject is here divided according to the old classification of Hartmann, namely, the ulcerative and the hypertrophic. In the former, according to Hartmann: "The whole of the iliac region is lost in a mass of adhesions, interspersed with caseous matter, and even purulent tuberculosis cavities, communicating sometimes with the intestinal tract." In the latter, "the cæcum appears externally increased in volume, more or less mobile in the iliac fossa and often included in a fibro-adipose mass, which attains a thickness of three to four cm."

About 300 cases have been reported. Within the last three years, the authors have met with two typical illustrations of the hypertrophic form of ileocaecal tuberculosis, full reports of which are given. In both of these cases the diagnosis was confirmed by the pathologist's report of the microscopical findings.

These cases appear to be equally common in male and female, and, while usually found between the ages of twenty and forty, may occur at any age.

The authors believe the pathological process to be one of tubercular invasion by way of the mucous membranes with necrosis, ulcerations, and central discharge, but in which the conservative forces, as expressed by the production of a limiting fibrous overgrowth, have largely gained the ascendancy.

The muscularis is much less affected than the submucous or the subserous layers, but is markedly thickened.

The hypertrophic form of ileocaecal tuberculosis is, the authors believe, rarely accompanied by other active foci of the disease; which favors the contention that it is a primary focus resulting from an infection by way of the intestinal contents, rather than by way of the blood or lymph-channels. Where ileocaecal involvement occurs as a complication of tuberculosis, the ulcerative, enteroperitoneal type is found.

The disease is the same and the tissue reaction is the same, the difference being in the degree and is dependent on: (1) strain or virulence of the infection; (2) the individual's power of resistance; (3) the character of the viscus affected. As affecting the cæcum, they believe that, while similar up to a certain point, where the reaction of healing fails or becomes dominant, the resulting condition differs distinctly, both as to the pathological pictures and the clinical manifestations — the one, the so-called enteroperitoneal type, progressing to perforation, with peritonitis or abscess formation; the other, the so-called hypertrophic type to which these cases belong, progressing toward scar formation and mechanical interference with the function of the bowel by tumor formation and obstruction. The increased bulk of the cæcum, they believe, is due, not to an increase in bulk of pre-existing normal parts, but to an actual loss of mucosa with infiltration by foreign cells with excessive proliferation or hyperplasia of fibrous cells from the connective tissue.

These cases present considerable difficulty in diagnosis. The onset is slow and gradual, and usually is associated with vague, indefinite pains in the right iliac fossa with symptoms of intestinal indigestion. At this stage it becomes impossible to rule out chronic appendicitis; when to these symptoms are added increased constipation with attacks of colicky pain and the discovery of a movable tumor, the possibility of malignant disease, with stricture, is at once suggested. At this period of the disease, the possibility of tuberculosis of the ileocaecal glands must not be overlooked. After the development of the palpable tumor, which does not disappear with the subsidence of pain in persons below the cancerous age, the tuberculosis process must always be thought of, and if the tumor is movable, the cæcal rather than the mesenteric glands would, most probably, be the location. Elevation of temperature and high leucocyte count are usually

wanting. In all cases of mobile tumor in the cæcal region, the possibility of its tubercular character must always be kept in mind, and preparation be made to properly deal with such a condition.

The only treatment, the authors believe, is surgical, the choice lying between ileocolostomy, with or without exclusion, and complete resection. Gage and Hunt believe that resection should be the operation of choice; in uncomplicated cases, if the patient is in good condition, the primary resection with lateral anastomosis is much easier, requiring less exposure of the abdominal contents, and less manipulation than the two-stage operation.

E. C. ROBITSHEK.

Kirmission, E.: Isolated Herniæ of the Ileocæcal Appendix (Des hernies isolées de l'appendice iléo-cæcal). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 81.

Generally speaking, ileocæcal appendix hernia is not rare, but it is met with in two varieties. While the presence of the ileocæcal appendix in a hernial sac together with the cæcum and some loops of the small intestine is not exceptional, yet isolated hernia of the appendix is met with very rarely.

The author reported a case in 1905 and he now reports two additional cases. The first was in a boy nine and one-half years old and the second in a man of 35. The characteristic common to all three cases was the presence in the hernial sac of a long voluminous appendix attached throughout its whole extent to the posterior wall of the sac.

W. A. BRENNAN.

Johnson, P. P.: Right Colectomy with Special Reference to the End-Results of a Series of Twelve Cases. *Boston M. & S. J.*, 1917, clxxvi, 266.

There is a great diversity of opinion as to the advisability of operative procedures for the relief of intestinal stasis and its concomitant toxæmia depending upon functional disturbances of the colon, due, in part, to the fact that the end-results obtained in this country at least, by Lane's operations, total colectomy and ileosigmoidostomy, leave much to be desired.

His own experience with ileosigmoidostomy has been limited to three cases: once for an inoperable carcinoma of the cæcum and upper sigmoid, and twice for obstinate constipation associated with multiple adhesions. One of these patients has four to six movements daily and the constant presence of a large doughy mass in the cæcocolon; another has nine to thirteen movements daily, while the third patient has been lost sight of. There was an undoubted improvement over the original condition, but the results could not be considered as entirely satisfactory. Johnson himself says that he should, under no circumstances, consider the operation except as one of necessity.

He condemns colocolostomy and cæcosigmoidostomy, with which his experience has been limited to

three cases. Each has been an unqualified failure from the standpoint of relief from constipation.

He believes that, occupying a middle ground, is right colectomy, by which he means the removal of the terminal five or six inches of the ileum, the cæcocolon and the first few inches or more of the transverse colon. It appears to him that this operation is followed by less unpleasant postoperative sequelæ than total colectomy or ileosigmoidostomy, and to be fully as satisfactory in relieving stasis. Only such cases as have failed to be relieved by simpler measures are considered suitable for operation, and these simpler measures have consisted of proper abdominal support, exercises, regulation of diet, administration of suitable cathartics, intestinal antiseptics, lactic acid bacilli, colonic lavage, etc.

The author submits a brief summary of indications for operation and the end-results in a series of twelve cases of right colectomy. One patient had an incarcerated umbilical hernia, consisting of right colon and terminal ileum with necrosis of the cæcum, and two others had malignant disease of the cæcocolon. One of these had previously been operated upon and abandoned as hopeless. Now, eleven months after operation, he is well and working as a street laborer. The other died of extension of the disease in the tenth week. The remaining nine had symptoms assumed to be due to disturbances of colonic function. One patient had a chronic arthritis of two years' duration, becoming progressively worse, crippling her and confining her to bed. The right colon alone appeared to be at fault and was removed and at the same time the gall-bladder, which appeared slightly thickened, was drained. Cultures from it, however, were negative. Now, twenty-three months after operation, she is able to walk and use her hands although the X-ray suggests some extension of the hypertrophic process.

The second patient had had for ten years frequent bowel movements, often as high as twenty-five to thirty a day. The terminal ileum and right colon to what appeared to be the normal transverse colon were removed. Later a colostomy was done to facilitate irrigation. Under irrigation the movements dropped to seven, and in two weeks to four a day. They continued at about that average for several months, but after his return to work they increased to nine daily. Seven months after operation he reports a gain of fourteen pounds in weight, marked improvement in appearance and strength, and less nervousness.

Johnson states that it is possible that the operation was ill advised. Further time will be needed to determine its full value.

The other seven patients had symptoms which appeared primarily to be of gastric origin. Five had intermittent attacks of epigastric pain, persistent nausea, and vomiting, and constipation, associated with marked failure in general health, headaches, nervousness, faintness, and often dizziness. One of these had mental depression with suicidal tendencies. A sixth did not vomit often, and the

epigastric pain made its appearance in two or three hours instead of immediately after eating, and at operation flat, non-indurated ulcers were found. The seventh did not vomit, but presented the other symptoms, and in addition a persistent crippling right-sided pain. None of these was entirely well between attacks, but all were easily fatigued, subject to nervousness and epigastric discomfort due to flatulence. With two exceptions, all were constipated. One had normally five or six movements a day, and the other thought the bowels moved at least once a day but more often five or six times; the movements were then apt to be small, liquid, and to contain hard lumps. That the bowels are now normal in one case and require mild catharsis in the other after a right colectomy, rather confirms the author's statement that the frequency was due to stasis.

Of these seven, six were females and one male. The average age at which symptoms had begun to be more or less persistent was twenty-one and the average duration of the illness at the time a right colectomy was done was seven years. Five had had previous operations, four of them elsewhere. One had been operated upon twice and another four times; the latter had had an appendectomy, a laparotomy for adhesions, a vaginal repair, and finally a gastrojejunostomy for a supposed duodenal ulcer. Neither the history, X-ray, or later operative finding gave any evidence of ulcer.

Owing to the fact that these patients between their attacks often have a voracious appetite with sensation of faintness between meals, it is frequently assumed that the symptoms are due to an ulcer. Gastric analysis in five instances showed subacidity four times and within normal limits once. More frequently still, however, is the gastric disturbance supposed to be a reflex indigestion due to a chronic appendicitis. And what bears color to this belief is the fact that there is often tenderness and pain over the appendix, and at operation it may be in a state of chronic inflammation. Four of these seven patients had had their appendices removed, but their symptoms persisted.

The X-ray in every instance showed colonic stasis, and the principal and most striking operative finding was a marked mobility of the cæcocolon. In each case it could be brought well out of the wound and twice for seven or eight inches. Once there was found an embryonic condition of the colon, i.e., failure of rotation. Four times there was marked dilatation of the duodenum clear to the mesenteric root, and twice it was recorded as being much larger than the colon. Five times the presence of large amounts of faeces in the cæcum was noted. In practically every case there was marked enlargement of the retroperitoneal glands and also the so-called Jackson's membrane which, however, seemed to be more often supportive than obstructive.

Of these seven patients, five had been operated on two years or more, one about ten weeks and the other six. These last two, are, perhaps, too recent

for a consideration of their permanent end-results, although there is marked improvement in appearance and general health with a cessation of distressing symptoms. In the first, the relief from mental depression and an intractable vomiting of two month's duration was almost magical.

The remaining five patients are now able to be at their work and, with one exception, are entirely relieved of their symptoms and in every way improved in health.

It is interesting to note the effect of this operation on the function of the bowels. Of the twelve patients operated on, one with malignancy died in the tenth week, and definite knowledge of the patient with the umbilical hernia cannot be obtained, although she is known to be in good health and at her work as a domestic nurse. Of the other ten cases, six have one and at the most two normal movements daily, while one occasionally, and two habitually, require mild cathartics, and one has eight or nine where he had previously had as high as twenty-five or thirty. Improvement then in bowel function followed the right colectomy in every case, and there is no evidence that it has had any but a beneficial effect on the general health.

In a postoperative X-ray study of nine cases made for the purpose of determining whether the absence of an ileocæcal valve had any effect on the emptying of the small bowel, it was found that in no case was there any damming back in the ileum or any evidence of dilatation of this portion of the bowel. In all cases where there was no gastric stasis, the ileum was empty by ten and a half hours, and at this time, in practically every case, part of the meal was in the pelvic colon, even in those patients who were constipated. After this time there was apparent slowing of the current, as though the meal were being retained in the transverse colon for absorption.

The operation consisted in the removal of the last few inches of the ileum, cæcocolon, and about a third of the transverse colon. In his earliest cases, he did not remove as much of the transverse colon as he did later, and postoperative X-ray examination shows redundancy and ptosis of this portion of the colon, although the functional result is perfect. An ileostomy in a malignant case was done once and an ileocolostomy with suture eleven times; four times by lateral and seven by termino-lateral anastomosis. Pouching of the blind ends of the ileum is the principal disadvantage of the lateral method. In one case only, and then for fear of kinking, was the stump of the colon fastened to the anterior abdominal wall with good effect.

Although none of these patients could be classed as good surgical risks, there were no operative deaths. In nine cases an operative chart was kept, recording the blood-pressure every ten minutes and the pulse every five. In four instances there was a rather sharp drop in blood-pressure which was, however, in two cases overcome during operation. The two showing marked shock were malignant cases. The five remaining charts showed an undisturbed course

throughout, nor was the postoperative convalescence more serious than after the average major operation.

Johnson believes he has in right colectomy an operation which can be performed with a low mortality and which offers relief to those sufferers from intestinal stasis without imposing upon them any dangers of unpleasant end-results. The general health was in every way improved in the so-called functional cases of this series. The bowel function was in every way bettered; where constipation continued it was slight; where there had previously been diarrhoea, it was entirely remedied or markedly benefited.

E. C. ROBITSHEK.

Drueck, C. J.: Prolapse of the Rectum. *Internat. J. Surg.*, 1917, xxx, 36.

Prolapse varies greatly in degree, but may be described as:

1. Prolapse of the mucous membrane only, partial prolapse.

2. Prolapse of all coats, sometimes including a fold of the peritoneum, complete prolapse.

Incomplete prolapse occurs usually in children under five years of age, or in the aged. In mild cases the mucous membrane protrudes only at the time of defecation, returning spontaneously. At this time the color is normal, but after many protrusions it becomes deep red, even livid, in color. It is, however, quite painless. Later it may become oedematous and ulcerations may occur. The condition must be differentiated from polypus, external and internal hæmorrhoids.

In children prolapse can usually be cured without surgery after removal of the causative factor. In the tabetic or aged, surgical measures are necessary, consisting in the removal of elliptical shaped pieces of the mucosa at three or four points around the prolapse.

Complete prolapse, or descent of all the coats of the rectum, may be the result of imperfect prenatal fixation or of outside conditions which permit of constant dragging on the rectal attachments. The distinguishing feature of complete prolapse of small extent from an incomplete one of the same size is that the external surface of the protruding tumor is not continuous with the anal skin margin. In old cases hypertrophy occurs and replacement becomes difficult and painful.

In aged persons with relaxed sphincters the proidentia may be down all the time. Constipation is the rule but a teasing diarrhoea may be present. Pain is present only when ulceration occurs or when spasm of the sphincters constricts the prolapsed bowel. Strangulation is present only in the young and robust and may result in a spontaneous cure, though the resulting cicatrix may leave the patient worse off than before.

Prolapse of the third degree [indicates intussusception of the upper rectum, sigmoid, or colon into the lower rectum. The symptoms are ill-defined, at first protracted constipation and later irregular

diarrhoea usually being present. Sometimes vomiting and abdominal tenderness are seen. Here, too, the prolapsed portion may slough off, leaving an annular cicatrix, death resulting in about half of the cases, the local peritonitis becoming general or extravasation of faeces occurring through ulceration and perforation. The condition is diagnosed by feeling the sulcus between invaginating and invaginated parts. If the sulcus cannot be felt, it must be differentiated from volvulus, stricture, internal hernia, pressure by tumors outside the bowel, and obstruction due to biliary calculi, etc.

Palliative treatment is useless except in babies. All prophylactic measures should be taken, however, and predisposing conditions should be treated conservatively. Replacement is to be tried first without anaesthesia, but if unsuccessful after reasonable effort, an anaesthetic should be given and the gut replaced by continued pressure with a hot compress. In children the prolapse should be replaced and maintained by adhesive strapping. Cauterization of the prolapse is successful in the early stages, but later elliptical strips may be removed. Rectopexy is satisfactory in selected cases.

When the upper rectum prolapses colopexy must be resorted to in order to obtain a permanent cure. When the prolapse cannot be reduced because of adhesions or is so inflamed or gangrenous that it becomes inadvisable to replace it, excision must be performed, but this is not an operation of choice.

E. K. ARMSTRONG.

Mayo, C. H.: The Choice of Operative Procedure in Cancer of the Rectum and Pelvic Colon. *Ann. Surg.*, Phila., 1917, lxxv, 129.

The decision as to whether palliative or radical operation should be performed depends upon many factors, the chief ones being the location and extent of the cancer, the presence of metastases and associated local or general disease. With the exception of epithelioma of the anus, which is amenable to radium, treatment of cancer of the rectum and pelvic colon should be by some form of surgical procedure.

Of the radical operations of all kinds, owing probably to earlier attack as well as to improved technique, there has been considerable reduction of the mortality of late years. Thus at the Mayo Clinic in the five years preceding 1916 the operability of all cases was 53 per cent, in the last three years 71 per cent. The mortality from 1910 to 1913 was 17 per cent, from 1913 to 1916 was reduced to 12.5 per cent.

Owing to the inactivity of the lymphatic system in the large bowel cancer here is more slowly disseminated than that of the small intestine. It seems to be particularly slow in the aged.

In cancer of the sigmoid, if the greater part of the loop is destroyed, an abdominal opening is preferable to a perineal, due to the fact that the descending colon has little retentive power. Where the sigmoid loop can be preserved, a perineal anus will

give fair control of movements but not of gas. The author believes that much of the progress in this disease has come from abdominal exploration and the performance of abdominal colostomy with the sacrifice of a large area *en bloc* of the diseased bowel. The best results as to cure are obtained when the operation is not hampered by any special effort to re-establish the normal control of the anal outlet. Union of the intestine after resection is not followed by stricture if in the abdomen but, if extraperitoneal, it is practically always followed by stricture making colostomy necessary sooner or later.

The author believes that in cancer of the rectum and rectosigmoid the two-stage interval operation should be employed and describes the technique. Cancer of the sigmoid is well treated by the Mikulicz method which consists of freeing the diseased loop from its mesentery, securing it outside the abdomen and a few days later excision of the diseased area by cautery; then in from eight to ten days re-establishment of the intestine by applying crushing forceps with one blade in each of the intestinal tubes, entero-enterostomy being produced by gradual tightening of the forceps which will cut through in about five days. The external fistula may be closed later. Other modifications of this operation are described. The combined perineal and abdominal one-stage operation is a very radical procedure having a mortality of 20 to 30 per cent. This operation, as modified by Cripps and by the author and performed in two stages is a safer procedure. The author's method consists in an abdominal incision, division of the sigmoid, establishment of a permanent abdominal anus, closure of the distal sigmoid, and invaginating the end, closing the brim of the pelvis over it with peritoneal-covered tissues and peritoneal folds secured to the back of the bladder or uterus; one week later removal of the rectum through the Kraske perineal incision. By this method the general abdominal cavity is not opened at the second operation.

HORACE BINNEY.

Goz, E.: Anal Fistula (Kasuistische Beitrage zur Fistula ani). *Beitr. z. klin. Chir.*, 1916, xcix, 268.

Goz refers to 95 cases of anal fistula of which he was able to follow up the late results in 58 per cent. Of the series, 16 per cent of the cases were in females; 28.59 per cent had complete fistula; 60 per cent had incomplete external fistula; and 2.5 per cent had incomplete internal fistula. The ages varied from 20 to 50 years which shows that anal fistula is rare in early years. Sometimes the fistula is of congenital origin. There exist then from the etiological standpoint fistulae identical with Morgagni's lacuna or with cystic dilatation of Hermann's sinus. Other anal fistulae result consecutive to abdominal typhoid due to ulcerative processes, to diabetes, and to chronic intestinal stasis. Foreign bodies — small pieces of detached bone and the like — have an important etiological significance, becoming inclosed in the supra-anal parts of the

rectum and passing through the mucosa, giving origin to parietal abscesses. The author reports 2 such cases, but in his opinion the principal factors in the causation of anal fistulae are hæmorrhoids and tuberculosis. In his personal statistics hæmorrhoids figure as the direct cause in 24 per cent and tuberculosis in 23 per cent.

In treatment Goz prefers the Paquelin cautery introduced through a sound under lumbar anaesthesia. This is better than any other of the known methods. Goz's personal results give 67 per cent of cures immediately after operation, 15 per cent sometime after, i.e., a total of 81.5 per cent of cures. These results are contrasted with those obtained by others. Short histories of the 95 cases are given.

W. A. BRENNAN.

LIVER, PANCREAS, AND SPLEEN

Phemister, D. B.: Echinococcus Cyst of the Liver Complicated Later by Subphrenic Pyopneumothorax. *Surg. Clin.*, Chicago, 1917, i, 203.

A very interesting case history is given and the differential diagnosis of this condition and liver tumors is carefully given. The case was diagnosed before operation; the complement-fixation test introduced by Weinberg was positive.

This cyst was drained and six weeks after operation a subphrenic pyopneumothorax developed. This was drained transpleurally, however, excluding the pleura, and then was followed by a hydropneumothorax.

K. L. VEHE.

Bevan, A. D.: Gall-Stone Disease. *Surg. Clin.*, Chicago, 1917, i, 1.

Bevan gives an interesting sketch of the development of gall-stone surgery from 1860 to date which carries through a period in which the mortality of interference in this condition has been reduced from 30 per cent to less than 1 per cent for gall-bladder stones, and 5 per cent in common duct-stones.

"Gall-stones are the result of a mycotic infection of the mucous membrane of the bile tracts." The colon bacillus is the most common causative organism. The typhoid bacillus is a common cause. Pus organisms of such low virulence as not to produce pus also infect the tract so as to result in gall-stones. The products of a catarrhal inflammation form nuclei for the deposits of bilirubin and biliverdin calcium and carbonated calcium. These deposits may occur in layers. Gall-stone formation may be purely chemical but the clinical picture is usually that of mycotic infection.

Gall-stone disease is five times as common in women as in men and is rare in early life, being most common between 30 and 60. It is more common after pregnancy.

Gall-stones may be latent or they may produce symptoms in two ways, by their mechanical action and by their presence lighting up gall-tract infection. Excess mucous production plus swelling of

the mucous membrane with varying degrees of gall-tract obstruction leads to an increase of intracystic tension. This causes pain. Intracystic tension rather than peristaltic action even when exerted on a stone causes pain. This is shown by the absence of pain following gall-bladder drainage when stones have been unfortunately left in the common duct.

The incision was S-shaped beginning at the ensiform, curving to the right to reach the middle of the rectus, then carried down over its middle 4 to 6 inches when it curved out, concave to right, completing the S. The lower end is just at the upper level of the umbilicus. This is carried down to the anterior rectus sheath which is divided longitudinally about its middle. A blunt dissector split the rectus to expose its posterior sheath which is composed of the transversalis and half of the internal oblique aponeurosis. This and the peritoneum are divided by one cut almost the same length as the original incision. A wide exposure is insisted upon, permitting complete access and lessening the chance of overlooking cystic and common duct-stones.

Extensive adhesions between the gall-bladder, omentum, liver, and colon were found. These were separated, revealing a gall-bladder full of pus and stones. A cholecystectomy was done. Illustrations accompany to show the technique when the gall-bladder is dissected from below after clamping and cutting the cystic duct and artery and when it is dissected from above clamping the duct and artery last. A full curved clamp introduced by Bevan for this latter purpose is also illustrated.

The diagnosis is considered and attention called to the necessity of including duodenal ulcer, kidney stone, and chronic appendicitis. The danger of hæmorrhage in operating upon cholæmic patients is emphasized. The relation of gall-stone disease to acute and chronic pancreatitis and to gall-tract carcinoma are discussed. Paralytic ileus may result from a localized infection about the gall-tract.

The author concludes that gall-stone disease is a surgical condition unless age or other disease prohibits operative interference.

Cholecystectomy is done in about 90 per cent of cases, cholecystotomy being reserved for simple cases with little gall-bladder change and no cystic duct-stones. The latter condition demands cholecystectomy. Common duct-stones are attacked by direct incision (choledochotomy) and drainage. Stones in the ampulla should be reached by the transduodenal route. Chronic pancreatitis accompanying may demand a cholecystenterostomy.

K. L. VEHE.

Wilcox, S. F.: Gall-Stones. *J. Am. Inst. Homœop.*, 1917, ix, 795.

The author discusses the etiology, symptomatology, and signs of cholelithiasis. The diagnosis, which is frequently easy, is positive only with the discovery of stone in the stools. Characteristic symptoms, held necessary for a diagnosis, often are lacking; histories have shown typical colic in

but 25 per cent of the cases operated upon and jaundice was frequently not present even with stones in the common duct.

A differential diagnosis must exclude non-calculous cholecystitis, renal colic, gastralgia, enteralgia, and nervous hepatic colic.

Roentgenologists have claimed a diagnosis in 50 per cent of cases by means of the X-ray but the author has found it of no assistance. Some cases presenting no definite symptoms have been discovered only on operating for other causes. Cases presenting gastric or neurotic symptoms but no roentgen evidence of stomach lesion should have roentgen examination of the gall-bladder.

As indication for operation the author does not consider a single colic attack sufficient unless persistent and unrelieved by medicine. Repeated characteristic attacks indicate an operation and repeated obscure attacks that are medically unrelieved warrant an exploratory operation for possible gall-stones or other surgical conditions.

The author cites seven cases, illustrating the worth of an exploratory operation in an obscure case and the advisability of early operation to avoid complications and inflammatory changes with repeated attacks. The gall-bladder was removed in three of these cases.

The author states that he has seen good results from careful medication and concludes as follows:

1. An operation should be performed where there have been repeated attacks and no relief from medicine.

2. An exploratory laparotomy should be performed where the symptoms point toward a probable, but not positive, diagnosis of gall-stones.

To avoid recurrence, cholecystectomy, where practicable, is preferable to cholecystostomy.

JESSE D. COOK.

Deaver, J. B.: Recurrence of Gall-Stones. *Am. J. Surg.*, 1917, xxxi, 17.

About 4.07 per cent of 1,031 cases of biliary affections operated upon by Deaver at the German Hospital of Philadelphia were secondary cases. The time elapsing since the primary intervention varied from seven months to seventeen years; 60 per cent required reoperation within one year. The most common cases of recurrence of symptoms after cholecystostomy in a combined series of 1,825 operations were: stone or stones in the gall-bladder 12 cases, adhesions 8 cases, stone or stones in the common duct 6 cases. In the earlier series mentioned there were 4 reoperations after cholecystectomy, 2 for stricture of the pancreatic portion of the common duct or the duodenal orifice, and one each for stone in the common duct and postoperative duodenal fistula. The failure to remove all of the gall-stones at the primary operation is the most potent cause of recurrence of symptoms. Renewed infection or failure to remove all infection at the first operation was indicated by the presence of acute or chronic cholecystitis, chronic cholangitis, biliary

cirrhosis, and pancreatitis at subsequent operation. Some of the less common causes of recurrence of symptoms were obstruction at the papilla of Vater, biliary fistulæ, internal and external, and interstitial pancreatitis and pancreatic lymphangitis. Chronic cholangitis must also be reckoned with. Deaver has a patient who has worn a "T" tube more than three years and is perfectly well, and others who have worn tubes shorter periods who are doing their usual work. The avoidance of the formation and the recurrence of gall-stones by a cholesterine free diet remains to be seen. The most common preventable cause of recurrence of disease of the biliary passages is late operation, and until this fact has impressed itself indelibly upon the physician as well as on the layman, the percentage of complete cures of gall-bladder and associated diseases cannot be expected.

CARL R. STEINKE.

Nichols, H. J.: Alkaline Treatment of Early Gall-Bladder Carriers, with Observations on Their Detection by Aid of the Duodenal Tube. *J. Am. M. Ass.*, 1917, lxxviii, 958.

Gall-bladder carriers include carriers of the typhoid fever group, cholera, and probably bacillary dysentery.

The antiseptic action of the bile was found to be due to the alkalinity of the bile which point suggested the alkaline treatment of carriers, especially the incipient cases. Carriers are detected by the use of the duodenal tube, the duodenal contents being removed and cultures made from the contents. Out of twenty cases Nichols reports one typhoid and one paratyphoid, positive to culture, which were apparently cured by alkaline treatment. These two positive cases showed no distinct microscopic or macroscopic evidence of infection, although carriers of longer standing would probably show some pus-cells. Blood-cultures and stool-cultures were negative in both cases. Short abstracts are given of the two cases.

Sodium bicarbonate, 2 gm., was given in each case three times a day for ten days with negative findings at the end of this time. Whether the bacilli are constantly or only intermittently present in the duodenal contents of the carrier will have to be determined by further work.

The reasons for trying to cure early carriers through influencing the reaction of bile are: (1) The bile is first and always infected. (2) It spontaneously frees itself from infection in most cases by its antiseptic action. (3) The antiseptic action is largely dependent on its alkaline reaction and the reaction of bile can be made more alkaline by appropriate means. (4) In case of a combined gall-bladder and urinary bladder carrier, the case would of course require separate lines of treatment, one alkaline and the other acid. Many other factors, such as the effect of the infection itself on the reaction of the bile, the extent to which the reaction can be changed, and the amount of alkali required remain to be determined.

The conclusions are as follows:

1. The mechanism of gall-bladder infection in the typhoid group, cholera, and bacillary dysentery is by descending infection in the bile from the liver and not by emboli in the gall-bladder wall.

2. Alkalinity of the bile favors its antiseptic action, and the reaction of the bile can be affected by the administration of alkalies.

3. The detection of early gall-bladder carriers by examination of the duodenal contents is "a simpler and more reliable method" (Garbat) than examination of the fæces.

4. Alkaline treatment is suggested for early gall-bladder carriers.

CARL R. STEINKE.

Belaustegui, E.: Total Cholerrhagia After Operation for Hydatid Cyst (Colerragia total después de una operación por quiste hidático). *Prensa méd. argent.*, 1916, iii, 223.

Belaustegui reports a case in a woman of 36 years who showed a hydatid cyst in the lower face of the liver with pronounced ptosis of this organ, and being at the same time three months pregnant. She was operated upon and the pregnancy went to term.

A few years later a fistula appeared from which a large quantity of bile escaped. The patient entered the hospital with icterus and in a very emaciated condition. The abdomen showed an orifice in the middle of the old operative scar through which abundant bile flowed. The fistulous tract could be followed for about 9 cm. This was tamponed but the collected fluid forced the tampon out, after a few hours. The woman was operated upon again and Vater's ampulla was found completely obstructed by a calculus. Bile continued to flow for some time but in decreasing quantity. Finally the woman fully recovered.

W. A. BRENNAN.

Eisendrath, D. N.: Overlooked Common Duct Stones. *J. Am. M. Ass.*, 1917, lxxviii, 968.

Attention is directed to the fact that common duct calculi may be easily overlooked if too much reliance is placed upon palpation and the clinical history. In about twenty per cent of all cases of common duct calculi there is no history of either chills, icterus, or fever, in fact nothing pointing to the existence of any infection of the common, hepatic, or intrahepatic ducts. Kehr, who is quoted by the author, found calculi in the common duct in 46 per cent of the 36 cases in which palpation of the common duct was negative. In 10 out of 30 of the author's cases in which the common duct was opened upon certain indications, calculi were found either in the common or hepatic ducts or both when palpation had been negative. This is explained by the fact that the calculi lie just above the ampulla in thick bile and thus escape detection by the method of palpating the supraduodenal portion of the common duct.

The duct should invariably be opened if the patient's condition will permit. Of the four indica-

tions given by Kehr, three have seemed of especial importance, in the order named: (1) the presence of many small calculi in the gall-bladder or cystic duct; (2) an enlarged, thick-walled common duct; (3) the presence of chills, fever, or icterus. To these he would add a fourth: recurrence of pain or symptoms of cholangitis (chills, fever, etc.) after previous choledochostomies.

Some of the cases of recurrence after cholecystectomy with or without drainage of the common duct may be explained by the formation of calculi within the liver itself, a condition which existed in two of the author's cases. His technique employed in opening the common duct will appear in a second paper.

His conclusions are as follows:

1. In 20 per cent of cases of calculi in the hepatic and common ducts, either no symptoms indicative of their presence are found or they are overshadowed by those of an accompanying gall-bladder condition.
2. In the past four years calculi have been found at the lower end of the common duct in 10 of 30 cases in which palpation was negative.
3. Exploration of the common duct does not increase the mortality, and should be done whenever one of the indications given above is present.
4. Recurrence following operations on the gall-bladder and common duct may be due to overlooked or newly formed calculi in the intrahepatic bile passage.

Wieland, F., and Quesada, F.: Cystic Dilatation of the Hepatic Duct Through Stenosis of the Pancreatic Segment (*Dilatacion quística del hepato-coledoco por estenosis del segmento pancreático*). *Cron. méd.*, Lima, 1916, xxxiii, 421.

The authors describe the details of a case of saccular dilatation in the bile passages by stenosis of the pancreatic segment, which they state is the first case of the kind registered in the Peruvian literature. The patient was a man of 22, who for two years had suffered from digestive disturbance. On examination a round tumor was palpated in the right hypochondriac region, not painful on pressure. The liver was normal. The urine showed the presence of bile elements.

Operative intervention disclosed a voluminous cystic tumor, the minute examination of which was prevented by numerous adhesions. The cyst was punctured and three liters of greenish fluid withdrawn. The cyst was marsupialized, the abdomen closed and drained. The patient died eight days later. Autopsy showed that the body of the gall-bladder was united to the liver by connective tissue. There was a very pronounced dilatation in the vertex of the angle formed by the neck and cystic duct. The dilatation passed beyond the anterior edge of the liver. The cystic ganglion could not be found. The cystic canal which normally is about 33 to 45 mm. was lengthened to 5 cm. and its width at its origin 6 mm., which increased to 16 mm. at the hepatocholedochus end.

The biliary passage was a vast cavity reaching the size of a foetal head. This saccular dilatation corresponded in its greater diameter to the supra- and retro-duodenal parts of the bile-ducts, being larger in the latter than in the former. The dilated choledochus walls had grooved out a furrow in the lower face of the liver. The bile-duct in the origin of the retropancreatic portion was strictured to the extent of a few millimeters. The parietal part of the duct did not exist; the pancreatic duct was slightly dilated and this alone terminated in Vater's ampulla.

W. A. BRENNANS.

Deaver, J. B.: The Principles Underlying the Surgery of the Pancreas. *Boston M. & S. J.*, 1917, clxxvi, 187.

Reginald Fitz, in 1889, first called attention to the more striking pictures of pancreatic disease. Since then the opportunities for observation *in vivo* by the rapid advances in abdominal surgery, have led to the accumulation of considerable clinical data.

While complete experimental proof is lacking, owing to the complexity of the factors involved, including the varieties of bacteria, the selective affinities and toxicity of each, the general and local individual resistance and certain mechanical factors, yet we believe that pancreatitis is, with few exceptions, an infective disorder, propagated in the majority of instances from those frequent foci of upper abdominal infections, the duodenum and gall-bladder; that the infection arrives usually by way of the lymphatics; that acute pancreatitis is usually infection plus ferment activity, though it may be traumatic or chemical in exceptional instances; that the most common form of chronic pancreatitis, as seen by the surgeon, begins as a pancreatic lymphangitis depending for its origin and often for its continuance upon a primary infected focus in the neighborhood.

The surgical treatment of acute pancreatitis must be directed at the cause of the condition if it can be found. The ultra-acute cases can only be sectioned and hastily drained, but the less desperate variety offers opportunity for the removal of stones in the biliary tract, if present, and drainage if any indication of infection exists. Cholecystectomy is not advocated because of its time-consuming character, but recurrences of infection are more common when the gall-bladder has been simply drained. Beyond a doubt early operation is valuable, nothing but profound shock warranting delay.

Free drainage of the pancreas is a desideratum, and to that end, the peritoneum over the organ should be scarified so that gauze drainage may be brought into direct contact with the surface. A large aspirating syringe will detect collections of fluid and these should be opened freely. Peripancreatic collections sometimes form in the lesser sac and point in the left loin, where they may be evacuated. Abscesses presenting anteriorly rarely adhere to the parietal peritoneum, and must be

evacuated transperitoneally, sometimes advisably by a two-stage operation.

Resulting sinuses are occasionally troublesome, the effects of the ferments evidencing themselves in the irritation of the skin. A strict antidiabetic diet and bland ointments to the skin are of help. Acute diffuse peritonitis, the result of ultra-acute pancreatitis presents the worst form of the acute abdomen. In these cases it is best to defer operation until the peritonitic process has become limited by the observance of strict anatomic and physiologic rest.

The treatment of chronic pancreatitis resolves itself into a question of the best operative treatment of the disease of the biliary tract which is found at operation. The interstitial character of any infection of the gall-bladder inclines one to a cholecystectomy. If there is evidence of obstruction of the common duct, gall-bladder drainage for an indefinite time or cholecystoduodenostomy are the operations of choice.

In the diagnosis of the milder grades of pancreatitis, functional tests, sugar tests, and ferment tests are of no use, nor do the stools show evidence of pancreatic insufficiency in the early cases. The diagnosis is a clinical inference based on the fact that pancreatic disease is associated with biliary disease in from 10 to 30 per cent of all cases, that it is more often present with long-standing disease and more frequently with common duct involvement than with purely cholecystic inflammations.

E. K. ARMSTRONG.

Rogers, L.: Chronic Splenomegaly in Lower Bengal with Special Reference to the Prevalence and Clinical Differentiation of Kala-Azar. *Indian M. Gaz.*, 1917, lii, 7.

Observations conducted at the Medical College Hospital in cases of kala-azar with reference to its connection to chronic splenomegaly are reported and an analysis of these made by the author.

In making splenic punctures, considered the most reliable method of demonstrating the parasite of kala-azar, the contra-indications are: ascites, a very high degree of anæmia, a tendency to bleeding from nose or gums, jaundice, or any serious complication. The evening before and just before puncture 20 grains calcium chloride is given. The needle should be as fine as can be secured; firm pressure is applied immediately afterward and the patient kept in a recumbent position for twenty-four hours. Liver puncture is as dangerous and not so reliable. Of the cases studied only 39.8 per cent of splenic enlargements showed kala-azar parasites.

Geographically, 36.4 per cent of the positive kala-azar cases originated in Calcutta, while 90 per cent of the negative originated in districts which are notoriously malarious, thus strongly indicating a malarial nature.

There was no seasonal difference between the positive and negative cases.

Regarding the difference in degree of anæmia

there was practically none between the two classes, although the negative showed a slightly increased percentage of the higher degrees of anæmia.

Fully 50 per cent of the positive kala-azar cases showed the high degree of leucopenia of less than 1 white to 1,500 red corpuscles against 18 per cent of the negative cases. Again, 80.3 per cent of the positive showed less than 1 white to 1,000 red against 43 per cent of the negative. On the other hand normal counts were met in only 19.7 per cent of the positive cases as against 57 per cent of the negative. Thus, it appears that a high leucopenia appearing within a year of the onset of symptoms is practically diagnostic of kala-azar.

In 62 per cent of the negative cases the spleen extended to below the navel against 51.5 per cent of the positive ones; thus the degree of splenic enlargement affords no diagnostic aid. Again, the liver was more frequently enlarged in the positive cases than in the negative although the percentage of cases in which this extended two inches or more below the ribs was about equal in both positive and negative.

Clinically, the most characteristic feature of kala-azar is the great and progressive emaciation which occurs in advanced cases. From a tabular study of the series it appears that a low body weight for the age of the patient is much in favor of a diagnosis of active kala-azar, while if weight continues to be lost under treatment the suspicion is practically a certainty.

Regarding the fever, the duration before admission was much longer in the negative case, 52 per cent giving a history of two years or more, absence of remissions for several months three times as frequent in the positive, and a history of a double rise four times as common in the positive. Therefore the majority of negative cases with very prolonged history of fever on and off were relapsing malaria with chronically enlarged spleens.

In the hospital the most striking and constant feature of the fever was its persistence and the failure of quinine to affect it, scarcely a day passing for a month without some rise of temperature. Of the negative cases 51 per cent ran no temperature, and 31 per cent ceased under treatment, while in only 10.6 per cent of the positive was this true. Again, 25.6 per cent of the positives showed a remittent type of fever, and 10 per cent of the negatives.

Under treatment, the shortest time for cessation of the fever in the positives was fifteen to twenty-seven days and the longest two and one-half months; of the negatives only 8 continued longer than a week after quinine was given.

Briefly summed up the diagnostic values of the temperature curve are: (1) Cases of chronic splenomegaly in which the fever falls to normal within a week on adequate doses of quinine are probably malarial. (2) In cases in which the fever persists over a week in spite of treatment the probability is that they are kala-azar.

For treatment of the positive cases a 2 per cent solution of tartar emetic should be injected intravenously, two or three times a week beginning with 3 ccm. and increasing 1 ccm. at each dose to 10 ccm. Care must be taken not to inject outside the vein as sloughing will follow. Results follow within one or two months.

Rogers summarizes as follows:

1. Splenectomies in 166 cases of chronic splenomegaly cases in lower Bengal have revealed the parasites of kala-azar in only 40 per cent. Of 114 cases showing fever while in the hospital Leishman-Donovan bodies were found in 57 per cent. The disease was more frequently contracted in Calcutta than in rural areas as compared with chronic malaria. Beyond Calcutta, the Presidency and Burdwan Divisions are most infected with kala-azar, while the Rajshahi Division and Bihar yield the next largest number of cases.

2. The size of the spleen and liver, the degree of anæmia, and the seasonal incidence of the admission afford no material help in distinguishing between kala-azar and chronic malaria, which have been so hopelessly confused for the last century in Eastern India.

3. Great leucopenia, such as less than 1 white corpuscle to 1,500 red, is greatly in favor of kala-azar, and if the fever has persisted for less than one year, it is practically diagnostic of that disease.

4. Marked loss of weight, especially if it continues under treatment in the hospital, is as much in favor of kala-azar as against chronic malaria.

5. In cases of splenomegaly, a history of fever on and off for three years or more is almost diagnostic of chronic malaria as against kala-azar.

6. The temperature curve affords the greatest diagnostic aid in chronic splenomegaly in Lower Bengal. If the fever is absent, or ceases within seven days with or without quinine, active kala-azar can practically be excluded; while if fever persists beyond a week in spite of 20 to 30 grains of quinine a day, the case is so extremely likely to be kala-azar that the patient should be treated as such by tartar emetic intravenously, which is a specific remedy for the disease.

P. M. CHASE.

MISCELLANEOUS

Lockwood, A. L., Kennedy, C. M., Mache, R. B., and Charles, S. F. A.: The Treatment of Gun-shot Wounds of the Abdomen. *Brit. M. J.*, 1917, i, 317.

A report is given of a study of 500 cases treated at the most advanced casualty station during a period of active fighting. The cases were admitted from nine to thirty-six hours after injury. They came in rushes — 30 abdominal cases and 60 others requiring operation during one period of three hours.

Of the 500 cases 336 were operated upon. Of the remaining 144, 128 were moribund on admission.

Whether or not to operate in any given case was determined essentially by the pulse. A pulse-rate of over 120 was usually considered a contra-indication to immediate operation but such apparently hopeless cases often responded to salines and stimulation sufficiently to withstand operation. In cases of concealed hæmorrhage, however, such delay will only allow the patient to slip further away from any hope of recovery. Aside from the pulse the typical picture of a case requiring operation was abdominal pain and rigidity, limited abdominal movement with respiration and vomiting. A large percentage of shell wounds of the abdomen were through the buttocks and back.

Shock accounted for most deaths within the first twenty-four hours after operation. General peritonitis was present. At operation control of hæmorrhage and determining the nature and state of injury were the first considerations. Resection of the intestine, it was found, was to be avoided if possible. Splenectomy or nephrectomy was done only when the organ in question was grossly lacerated. A certain per cent of lacerated kidneys recovered. Hæmorrhage from the liver was controlled by deep stitches or by rubber tissue packing. Gauze should never be packed into liver substance and no foreign body should be left in the substance of liver, kidney, or spleen. Perforations of the diaphragm were common and particularly fatal if not closed, but if sutured the mortality rate was greatly lowered. Gaseous distention from paralysis of the bowel practically never occurred if the gut was gently milked from above the distended area to just below the point of repair. Extravasation of bowel or stomach contents was removed by gauze wrung out in hot saline solution. Intra-abdominal lavage was found to be especially disastrous. A minimum amount of rubber tubing or tissue drainage was used. Exaggerated Fowler's position and saline per rectum constituted the essentials of postoperative treatment.

The earlier the patients were operated upon the better the results. These justified laparotomy as late as twenty hours after injury. In cases seen after twenty to thirty hours judgment was difficult. One case operated upon forty-six hours after injury with closure of two perforations recovered.

Autopsy performed in 80 per cent of non-operative cases showed hæmorrhage to be the most common cause of death. Shock accounted for most of the deaths within twenty-four hours after operation.

General peritonitis was present in 50 per cent of cases operated upon after twelve hours following injury. Gas gangrene was the cause of death in at least 30 per cent of fatal cases. The operative mortality in the 336 cases was 52 per cent.

The authors conclude that every case should be dealt with early as its urgency demands and that abdominal surgery is at least as productive of results as is the surgery of fractured skull, compound fractures of the femur, and the like. C. A. HEDBLOM.

Walters, C. F., Rollinson, H. D., Jordan, A. R., and Banks, A. G.: *A Series of 500 Emergency Operations for Abdominal Wounds*. *Lancet*, Lond., 1917, cxcii, 207.

The authors give the results of the first 500 operations for abdominal war wounds. A large number of the cases were received as early as three hours after the infliction of the wound, but the average was a great deal higher than this. With the advance of the line and a more mobile condition of fighting the time has tended to increase. The delay is quite unavoidable and is due to the difficulty in getting the wounded men out of the battle area. From a careful comparison of their cases they are quite positive that the time element is of the highest importance and that an abdominal patient's chances diminish with every hour of delay. The vast majority of the patients reach them within nine or ten hours, and a large percentage in half that time, but a certain number of cases arrive at much later periods, up to three or four days, and the treatment of such late cases must be entirely different from the early ones, the expectant treatment being as a rule adopted in such late cases because it may be assumed that the visceral injury, if the patient is in operable condition after forty-eight hours, is not severe and the hæmorrhage has entirely ceased. Every case should be judged on its own merits but operation thus late has a very high death-rate. They advise watching a man who is in fair condition and has been wounded more than thirty-six hours unless there is some clear condition or indication for operating. In cases four or five days after the injury there is usually general peritonitis, and here it is advisable to drain the pouch of Douglas through a small incision.

The mortality of a large series of cases operated upon is nearly 50 per cent, and although they have no actual data as to what it would be if the same cases were left without operation there is some reason for believing that it would be somewhere in the region of 90 per cent. In perhaps one-half of the patients the questions arise whether the patient can stand the operation, and secondly, whether he is suffering from a true penetrating abdominal wound with injury to a hollow viscus. They found it extremely valuable to establish an observation ward where the patients who were doubtful, and in addition those hopelessly moribund and those who could be pronounced off hand to have non-penetrating wounds and who were merely waiting for transport to a clearing station, could be placed. The surgeons made it a practice to visit these patients frequently during the day as they were separated from the operative cases. They found it the best arrangement to take the patients first who were in the best condition and the most hopeful cases, and to leave until the last for further consideration the doubtful cases. There should be no question and if there is the least doubt as to whether or not there is an injury to a hollow viscus, such patient should be operated upon at once. Colostomy is not a dan-

ger to life and even if nothing is found no harm is done, while if there is a small visceral wound it can be closed in time to be of determining value in the issue of the case. In the patient whose condition is poor one should be guided by the fact that he will often benefit by a delay of two hours, but if there is no doubt at all that the patient has a serious visceral injury he should be operated upon unless actually moribund. If they show no sign of improvement in the two hours they seldom recover sufficiently to be operable in any less period than thirty or forty hours. Where the patient's condition is bad, but not inoperable, and at the same time there is a doubt about the diagnosis of an injury to a hollow viscera the patient should be given the benefit of the doubt by not operating. One point to be remembered in the diagnosis of penetrating wounds of the hollow viscera is that a man may have a severe injury to a hollow viscus without a penetration of the peritoneum. This is particularly the case where the missile has torn the abdominal wall and bared but not entered the parietal peritoneum. They had more than one such case in which the subjacent loop of small intestine was torn almost in two. In case of injury to the solid viscera even though they believe that such has taken place they think with the possible exception of a kidney wound they should be left alone. Wounds of the liver are seldom, if ever, benefited by operation. If very severe they are fatal, and if not severe the hæmorrhages usually cease and the surgeon checks by packing or suture the hæmorrhage he has created by interference. The same applies to small wounds of the spleen. It is only where the patient in cases of wound to the spleen is plainly suffering from hæmorrhage more than shock that an operation is indicated with a view of removal of the spleen. The essential point, then, is the diagnosis of injury of the hollow viscera.

In cases with protrusion of a viscus the diagnosis is of course easy. The most important point here is the condition of the intestine, whether it is itself injured or whether strangulated. If neither has occurred the prognosis is not very bad. If necessity for resection exists in these cases they are nearly always fatal. Projecting omentum, in itself is not a serious condition. It indicates nearly always a visceral injury and in this way it is an indication for operation. The first and most important step in the diagnosis of the "through-and-through" wound is to get all the possible information from the physician as to the nature of the wound.

They believe that exploration by the finger and probe should be done wherever possible. This in the reviewer's opinion is not the usual experience. The most difficult cases are those in which the diagnosis must be made from the symptoms and the examination of the abdomen alone. It is of course proved, as they remark, that wounds in the chest alone may give all the signs of an abdominal injury, while wounds in the back and buttocks may give rise to retroperitoneal hæmatomata which may

set up marked abdominal rigidity and tenderness. Pain is an uncertain and misleading symptom, so many of these patients having had large doses of morphia before being admitted to the station. Vomiting is of distinct value as a number who had visceral injuries had vomited before admission. Vomiting is particularly common in stomach injury. A history of the passage of flatus since the wound was made is against any wound of the colon, especially of the descending colon. A normal facial appearance is very greatly against a severe abdominal lesion, even if the pulse is bad, while an appearance of extreme shock may give a better hint of the truth than the pulse. Of the abdominal signs rigidity is of the utmost importance. It must not be forgotten that it may be due to chest wounds, retroperitoneal hæmatoma, or injury to the abdominal wall alone. Tenderness they consider a far more valuable positive sign. It may be produced by hæmorrhage into the peritoneum or by hæmorrhage into the tissue of the anterior abdominal wall. They have not found the attempt to define areas of hyperæsthesia of any value. The percussion signs in their opinion are valueless, and rectal examination is seldom of any value. The passage of a catheter may afford valuable information where injury to the urinary tract is suspected. The deciding factor in determining whether operation should be done or not is the patient's condition. If his chances after operation are not more than one in ten, or even one in five, it is far better not to operate, since even with a perforating visceral injury his chances may be as good. On the other hand, if the patient's condition is good, so that operation presents very little risk and the wound is so recent that possible visceral injury is present it is far better to explore. They have done a number of laparotomies in doubtful cases with negative results and the few who have died have all had serious complicating limb or other wounds.

A rising pulse-rate in the absence of an increasing temperature is nearly always an indication to operate even if the patient is quite comfortable. The only complete contra-indication is a complete spinal lesion with paralysis. In such cases diagnosis is impossible since they will give every abdominal sign and symptom without penetration, and in addition the prognosis, if operation is done, is practically hopeless. Those who encounter abdominal wounds for the first time are warned against this spinal lesion and every patient should be asked to move his legs. Another almost complete contra-indication is a wound of the chest definitely involving the lungs with hæmoptysis or surgical emphysema. Mortality is enormous in such cases. Only in rare cases should operation be done where viscera are protruding. Where there is a limb wound which demands amputation it is best to do the abdominal operation first and risk the leaving of the amputation till a few days later. They never had a successful case where one surgeon amputated while another operated upon the abdomen.

In regard to salines, they found them of little use in shock and of the utmost value in hæmorrhage. Rectal saline by intermittent small enemata is given as a routine measure for some days. As a rule they prefer a median long six-inch incision where the location of the injury is uncertain and the small intestine is almost certainly concerned. Where the injury can be localized to one side of the abdomen and there is a likelihood of the colon being affected either a vertical right or left rectus incision should be used or a transverse incision through the oblique muscles and extending into the rectus sheath, the latter being pulled inward with the muscles. Wherever possible the incision should be made separately from the original wound, the only place where this cannot be done is in cases of large wounds. The incision made to repair the injury should be closed completely, drainage tubes being inserted in separate stab wounds. Often the original wound can be utilized for drainage. In closing the wound the utmost time and care should be made to close it in layers. They consider silk safer for the peritoneum than chromic gut. One of the reasons for exercising such great care to close the wound in layers is that the frequent bronchitis and paralytic distention to which the sutures are subjected are much greater than in civilian abdominal surgery.

An examination of the abdominal contents should be done in an orderly routine manner. They first examine the ileocæcal region, then the small intestine in short lengths of a foot or so, the uninjured gut being rapidly returned by the assistant. When a tear is discovered the wounded portion is retained outside of the abdomen, the position of the first hole being marked by a light clamp or otherwise. The transverse colon and sigmoid are next examined; the flexure, rectum, and bladder have to be felt, but it is surprising how readily a hole can be detected by palpation. In some cases the missile will be found loose in the pouch of Douglas, and it should always be looked for at this site if not found elsewhere. The stomach may be distended and yet a considerable tear be present. If one hole is found a second should always be looked for unless the missile is found in the stomach. Do not operate for liver wounds alone, but if a small wound is found and is not bleeding it should be left alone; if large and inclined to bleed it may be packed. Suture is seldom, if ever, possible. Suture in wounds of the spleen is easier than in the liver and if this is not possible they may be packed. Splenectomy is reserved for the most serious cases. Although many kidney wounds can be detected by palpation through the peritoneum if the abdomen is open, yet there may be serious laceration concealed by a hæmatoma. If the kidney as well as the abdominal contents is affected the authors usually deal with the kidney through a separate lumbar incision. Transperitoneal nephrectomy is very difficult. They only remove the kidney where the tear extends across the hilum and hæmorrhage is present. In several cases an isolated portion of the cortex of considerable

size has been removed and a large gap sutured together with successful results.

A single row of Lembert's or a purse-string suture is all that is necessary for small holes in the intestine, double suture being necessary only for large tears. Resection should be avoided wherever it is possible. The authors generally do an end-to-end anastomosis. They can see no advantages in the lateral method and they believe that it requires more time. Wounds of the large intestine are nearly twice as fatal as those of the small gut. Fæcal fistula is quite frequent. A double row of sutures should invariably be used and the gut should be carefully cleansed with antiseptic after the first row is inserted. A piece of omentum may be stitched over the line of union. A colostomy should never be done if there is any possible way of suturing the large gut. In intraperitoneal wounds of the bladder it is safe to suture the same without drainage. A catheter should be tied in and in all bladder cases the pouch of Douglas is drained. Extraperitoneal bladder wounds do well if they are thoroughly drained. In every case where there has been escape of visceral contents they have drained the pouch of Douglas after the operation. If the drainage tube is near or in contact with the sutured large intestine it should be removed on the second day. In general it is unnecessary to retain any drainage tubes long, their purpose being served once a channel is formed.

Fowler's position is, of course, the rule. One of the most disappointing conditions in the after-treatment is secondary shock which appears twelve to twenty-four hours after operation in a patient who has apparently rallied well from the primary shock. This accounts for many deaths which are not easily explained or treated. It occurs most frequently in those who have had a well marked primary shock. They believe that this secondary shock can be prevented to some extent by placing the patient under observation for a short time so that they can be thoroughly warmed up and rested when they come in in a bad condition. The chief danger to a man who has been shot in the abdomen when he can be operated upon within a reasonable time is not peritonitis in their opinion but shock and hæmorrhage, and if these two could be entirely eliminated the mortality could be reduced by 30 to 40 per cent.

They consider it important to get the bowels open upon the third day if possible. One of the most valuable drugs is the administration of eserine in doses of one-hundredth of a grain every two hours. In cases where this fails and real obstructive symptoms appear, postmortem examination usually reveals a condition of general peritonitis with pockets of pus, adhesions, and often multiple kinks. Secondary operations in these cases are of little avail. The rate of recovery in the authors' first 500 operations was 49 per cent. They have ascertained that the number who died after leaving their hospital is not more than 5 per cent. D. N. EISENDRATH.

Fraser, J., and Drummond, H.: Three Hundred Perforating Wounds of the Abdomen. *Brit. M. J.*, 1917, i, 321.

Fraser reports the results of a clinical and experimental study. The animal experimentation was prompted by some of the problems that arose in dealing with a group of 70 cases previously reported. The relative merits of different forms of intestinal anastomosis, the effect of the presence of large quantities of blood in the peritoneal cavity, devascularization of the gut, and the use of omental grafts were investigated by experiments on cats and Belgian hares. Lateral anastomosis was found more reliable than end-to-end. Under aseptic conditions the presence of considerable quantities of blood in the peritoneal cavity did not interfere with convalescence following intestinal anastomosis.

Devascularization of one and one-half inches of small intestine produced gangrene but not in the large bowel. Omental grafts were proven useful only in the absence of sepsis. Wounds extending with the long axis of the bowel were more prone to leak than those extending transversely. The amount of extravasation, however, depended largely on the amount of bowel contents.

The experience with 300 cases of injuries of hollow and solid viscera is next detailed. It was found that the less the degree of damage to the gut and the fewer the number of perforations the more likelihood there was of extensive peritoneal soiling. The degree of shock is infinitely greater following resection than after extensive multiple suture. Extensive damage to the mesentery therefore is the only real indication for resection provided suture is mechanically practicable. In uncomplicated wounds of the small intestines requiring simple suture operation there was 100 per cent recoveries. Wounds of the colon often involve retroperitoneal tissue and appear particularly liable to secondary hæmorrhage from septic change in the gut. Suture, free drainage, or colostomy at or above the site of injury was the treatment in these cases.

In the vast majority of cases of penetrating wounds of the abdomen operative measures offer the best chance of success. It is only the rarest exception that spontaneous recovery follows rupture of hollow viscera. Cases admitted in collapse are first given symptomatic treatment. In case of doubt operation should be performed. Continuous rectal saline is the most important feature of the after-treatment.

The prognosis depends mostly on the degree of the injury and the length of time since the injury was sustained. Early operation offers the best chance of ultimate success. Operative mortality in these cases was as follows: stomach, 23 cases, 56.5 per cent; small intestines, 96 cases, 61.4 per cent; duodenum, 6 cases, 83 per cent; colon, 85 cases, 56.4 per cent; rectum, 10 cases, 70 per cent; bladder, 14 cases, 71 per cent; kidney, 27 cases, 41 per cent; spleen, 14 cases, 36 per cent; liver, 33 cases, 42 per cent.

C. A. HEDBLÖM.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Hess, J. H.: *Osteogenesis Imperfecta*. *Arch. Int. Med.*, 1917, xix, 163.

Osteogenesis imperfecta is a rare systemic disease of unknown etiology, characterized by imperfect development of bones. There is some evidence of its being inherited. It occurs in two clinical forms, osteogenesis imperfecta congenita and osteogenesis imperfecta tarda. The former term was coined by Vrolik in 1845. Synonyms for this disease are osteomalacia congenita, rachitis foetalis annularis, malacia myeloplastica, periosteal dysphasia, dystrophie periostale, ostitis parenchymatosa chronica, micro-melia annularis, osteoporosis congenita, and fragilitas ossium. Lobstein's description of osteop-sathyrosis idiopathica corresponds pathologically and symptomatically to osteogenesis imperfecta tarda.

The development of the bones is normal up to the formation of the primary marrow spaces. The spaces are not lined by bony cells, and this starts the abnormal development. There are some differences of opinion as to whether the process of absorption of bone remains within normal limits.

The primary pathological changes are of the same nature in all bones of the body, varying only in degree, but are best observed in the bones of the extremities. The bones are brittle, or so soft they may be bent or cut with a knife. They may be plump and short, or compressed, or cylindrical. The shortening is secondary to fractures and bendings, the primary growth in length being normal. Numerous thickenings due to healed fractures may be seen. Osteoblasts are markedly diminished in number while osteoclasts are strikingly too numerous.

The most prominent characteristic symptom is multiple fractures occurring on very slight provocation. The fractures are mostly complete with preserved periosteum. The mentality is usually underdeveloped, and the child is small and under weight. The head is usually excessive in size in proportion to the trunk.

The prognosis is unfavorable as a great majority are stillborn or die within the first three years of life. They often die of some intercurrent disease. The prognosis is more favorable for cases occurring later in childhood, as some seem to undergo spontaneous cure.

Hess goes into the etiology, pathogenesis, pathology, process of bone repairs, metabolism, and general symptoms. As to diagnosis he says roentgen-ray findings are characteristic and diagnostic for the disease. They may be summed up as follows:

1. Multiple, mostly intraperiosteal fractures, often showing areas of bone resorption at the seat of fracture.

2. Excessive callus formation.
 3. Deficient shadow formation seen in all bones of the body, due to increased permeability to roentgen rays. Often the bone shadow shows but little more density than the surrounding soft parts.
 4. The diaphysis of long bones may be slender, and only very rarely show any curvature or bending.
 5. The cortex is of irregular thickness, on the whole very thin and parchment-like in appearance and may even appear to be absent in some places. There is little or no tendency toward thickening on the concave side of the shaft.
 6. The spongiosa contains wide meshes and an absence of structural markings. These changes are not limited to the diaphysis. All bones show this change, but not to the same degree, the most marked changes being found in the bones of the hands.
 7. The medullary cavity is increased in size and shows irregularly mottled shadows.
 8. The epiphyseal cartilages and their centers of ossification are larger than normal and the epiphyseal lines are straight.
- Differential diagnosis from the following conditions is discussed: chondrodystrophia foetalis, cretinism, mongolism, rickets, infantile scurvy, syphilis, tuberculosis, and osteomyelitis.
- Roentgenographic illustrations of the various conditions are given to show the differentiation in the bone lesions of the different diseases.
- As to the treatment calcium salts, phosphorus, and cod liver oil should be given a thorough trial. Immobilization with moderate extension of the fractures by casts, prophylaxis against further fracture, fresh air and sunshine together with a diet containing fresh fruits and vegetables give the best results. He does not think the desiccated thyroid, parathyroid, thymus, suprarenal, anterior lobe of pituitary gland, and pineal gland have much value.
- Case reports are given of a girl sixteen months of age, 2 boys each three years of age, and a girl two years of age. The last mentioned died of bronchopneumonia, while the others seemed to have improved after several months in the hospital. Two prescriptions are given:

	gm. or ccm.
rx Phosphori.....	o
Olei morrhue.....	6o
M. Sig.: 4 ccm. twice daily.	
	gm. or ccm.
rx Calcii phosphoric. tribasic. puriss.....	6
Olei morrhue.....	6o
M. Sig.: 4 ccm. twice daily.	

CARL R. STEINKE.

Barrie, G.: *The Significance of Giant-Cells in Bone Lesions*. *Ann. Surg., Phila.*, 1917, lxx, 151.

The significance of the presence of giant-cells in bone lesions, particularly the type cell classified

under the terms "foreign body, scavenger (Barrie), multinucleated, myeloplax, or osteoclast," is still an open and debatable question among many workers interested in bone surgery and pathology.

While differing opinions are expressed, it may be stated that probably a majority accept the view that when numerous cells of the above-mentioned type are found in bone lesions, they signify a benign condition, provided the other cells composing the histopathologic picture give no evidence of malignant change.

Pathologists also express opposing views in their writing and teaching regarding the origin of the giant-cells. Divergent opinions in this respect are very pronounced, the author states.

Another active subject of contention and debate is the function the cells possess. This lack of agreement among pathologists, and their apparent inability to definitely decide the rôle all giant-cells play in pathologic processes and the exact position that should be assigned them has led to considerable confusion. The clinical surgeon especially has felt the need of a more clearly defined opinion upon which might be based future operative procedures. At the present time, many surgeons more or less discard and disregard the microscopic diagnosis of a giant-cell content, Barrie states, and rely upon their own interpretation of the clinical, X-ray, operative, and gross pathologic appearances of the lesion, as a whole, for guidance and decision in their efforts at operative therapeutic cure.

This attitude he considers unfortunate. In a great many instances a fairly conclusive and correct diagnosis may thus be made, but as he points out, in order to obtain complete and positive data, a microscopic finding, confirmatory or otherwise, is always desirable and sometimes essential.

Bearing these facts in mind, a consideration and discussion of the origin, function, and significance of giant-cells seemed to him justified, and particularly the relation and position they occupy in the lesion described by different writers under the following terms: (1) myeloid sarcoma; (2) medullary giant-cell sarcoma; (3) myeloma; (4) medullary giant-cell tumor (Bloodgood); (5) chronic hæmorrhagic osteomyelitis (Barrie).

The author finds that it is difficult in the light of our present knowledge to understand why the presence of these cells in bone lesions should be considered evidence of malignancy, or that they should be credited with producing autonomous growth. He believes there is no doubt they do indicate a mild inflammatory reaction. These characteristics of the cell have been known for a long time, and have been observed in tissues containing sutures, ligatures, and other sterile foreign substances. The presence of such cells he regards as truly beneficent and free from exerting any malign influence.

Therefore he believes that the presence of granulation tissue masses presupposes an inflammatory process of mild degree. As it seems to him impossible to prove that the giant-cells have anything to do

with tumor growth or tumor formation and all evidence points to their function as scavengers, or foreign body cells, brought forth for a definite purpose, and disappearing when that purpose is fulfilled, it does not seem that they can be effectively classed as tumor-cells.

Neither, he states, can the granulation tissue masses that compose these lesions rightly be termed tumors or neoplasms. He emphasizes the opinion, expressed in earlier papers, that this bone lesion should be grouped with the surgical diseases classified as inflammations.

From the clinical picture and gross and microscopic pathology it presents, he considers the term "chronic (proliferative) hæmorrhagic osteomyelitis" as perhaps more exact and correct than the other terms now in use.

GEORGE E. BEILBY.

Ryerson, E. W.: Ankylosis of the Elbow. *Surg. Clin.*, Chicago, 1917, i, 197.

During an arthroplasty undertaken to restore function in a joint stiffened by an ancient and arrested arthritis deformans the author discusses his technique in detail.

This procedure was characterized by a long posterior incision avoiding the olecranon and by a certain severance of the triceps. This latter was used instead of sawing the olecranon.

The prognosis in elbow, shoulder, hip, and knee arthroplasties is discussed, the latter giving the least successful results.

K. L. VEHE.

Kessel, L.: The Relation of Hypertrophic Osteoarthropathy to Pulmonary Tuberculosis. *Arch. Int. Med.*, 1917, xix, 239.

The literature to date contains about 43 cases. The 32 cases reported in this article were gathered from a service of about 100 patients suffering from pulmonary tuberculosis, all being in the second or third stage of the disease. Roentgen-ray examinations were made of the hands, feet, all the long bones, the bones of the pelvis, and in some instances the shoulder girdle and cranial bones. The cases were divided into three groups after the classification of Locke, as follows: (1) five patients presenting simple, well-defined clubbing of the fingers without bone changes; (2) seventeen patients showing clubbing of the fingers with bone changes in the phalanges; (3) ten patients with clubbed fingers and changes in the long bones. Each group has been tabulated as to age, number of years ill, stage of the disease, fever, dyspnoea, toxæmia, cough, and expectoration.

Of the 5 patients in Group 1, there were 3 males and 2 females, the age ranged from 19 to 42 years, and the length of illness ranged from 1 to 6 years.

Of the 17 patients in Group 2, 14 were males and 3 females, the age ranged from 18 to 63 years, and the length of illness from 1 to 6 years. The appearance of these patients was in no way different from those in Group 1.

All of the patients in Group 3 were males, the

age ranged from 25 to 43 years, and the length of illness from less than 1 to 11 years. Of the 10 patients in Group 3, 6 presented the globular nose formation and malar thickening. With the exception of the awkward appearance of the lower arms and legs in 3 patients, this group disclosed nothing in the physical examination to differentiate them from the patients in either of the other groups. The roentgen-ray examinations, however, revealed decided differences.

Ten skiagraphs are shown and one microphotograph showing a dense layer of new bone formation separating the periosteum from the cortex in a section from the lower end of the radius. Brief reviews are given for the cases of each group.

From a study of these 3 groups of patients in connection with the roentgen-ray examination, certain facts became evident and the conclusions are as follows:

1. The degree of clubbing corresponds only in a general way to the radiographic findings.
2. Bone changes occur more commonly than is ordinarily supposed in the so-called simple clubbed fingers.
3. Pronounced changes in the long bones may take place without any clinical sign or symptom being present.
4. Systematic roentgen-ray examinations reveal such changes.
5. The type of bone change in the various groups is the same, the difference being rather in the degree.
6. Hypertrophic osteo-arthritis is present more frequently in pulmonary tuberculosis than the usual clinical examination would permit us to believe.

The author states that in this whole series of patients the aim was to establish some relation between the clinical manifestations of the pulmonary disease and the type of osteo-arthritis present, but it was impossible to demonstrate a connection between the two.

A study of the tables will show that pronounced evidence of pulmonary tuberculosis may be associated, on the one hand, with simple clubbing of the fingers, while, on the other hand, less marked manifestations of the pulmonary disease may be accompanied by distinct changes in the long bones. The bone changes, moreover, are not definitely associated with the type or degree of the clinical expression of the pulmonary disease.

CARL R. STEINKE.

Ehrenfried, A.: Hereditary Deforming Chondrodysplasia—Multiple Cartilaginous Exostoses; a Review of the American Literature and Report of Twelve Cases. *J. Am. M. Ass.*, 1917, lxxiii, 502.

Ehrenfried has conducted a thorough study of this condition, which he claims is not infrequent. Males are more susceptible in the proportion of three males to one female, and they are suspected of conveying the condition to the male offspring, as evidenced by the hereditary tendency. The con-

dition is one affecting the bones during skeletal growth, and ceasing with skeletal maturity, and is usually a bilateral condition in its distribution.

The disease is now recognized as a distinct clinical entity, and is due to a disturbance of the bone-forming cartilage. Malignant degeneration is rare. Operation is indicated only when the tumor mass impinges on some vital structure, or for the relief of pain due to pressure.

C. L. HALL.

Romer, F.: Minor Injuries to Joints. *Brit. M. J.*, 1917, i, 183.

The attention of military surgeons is called to the much neglected subject of the treatment of ordinary sprains. Massage to cause absorption of the acute swelling is followed by strapping of the joint with adhesive plaster, care being taken not to make too tight a dressing. Treatment for dislocation of the shoulder-joint should be on the same lines as an ordinary sprain with a strip of adhesive plaster encircling the joint, all underhand movements being permitted. The arm should not be lifted above the shoulder for at least a week and then only by the masseur. In sprains of the knee-joint, early aspiration of the fluid is of greater benefit than keeping the leg rigid in a splint. Diagnosis is not always easy between a displaced, semi-lunar cartilage in the knee and a hypertrophied fold or fringe of the synovial membrane becoming nipped between the articular surfaces. The best treatment for the simpler cases of internal derangement is manipulation, followed by massage and at a later stage by strapping or bandaging the joint in such a way that only flexion and extension are possible. Radiographs should always be obtained in all cases of severe sprains or injuries of joints.

D. N. EISENDRATH.

Hutchinson, J.: Dupuytren's Contraction of the Palmar Fascia: Dupuytren's Life and Works. *Lancet*, Lond., 1917, cxcii, 285.

In long-standing and severe cases of Dupuytren's contraction certainly all those in which the affected digits are rigidly bent into the palm, the surgeon who trusts to the operations hitherto in vogue will be disappointed. Whether he divides or excises the palmar fascia he cannot straighten the contracted finger by manual force, still less can he trust to this being effected by subsequent splint-pressure, however prolonged.

As to the cause of continued contraction after operation, in which the fascia has been thoroughly divided or excised, obviously the skin will not account for this; it is easy to prove that the fault does not lie in consecutive contraction of the flexor tendons, and typical examples of Dupuytren's contraction show a perfectly smooth, adhesion-free articular surface in each joint. In the author's opinion the true reason is that, owing to the second phalanx being extremely flexed so that its base is pressed against the neck of the first phalanx, and, owing to this position being retained during many months or

years, the glenoid ligament in front of this joint, as well as the lateral ligaments, become shortened and incapable of extension.

As to the treatment, the only way to overcome this obstacle is to excise the head of the first phalanx. Briefly the method is as follows:

1. Through a palmar incision the bands of contracted and thickened fascia are dissected out, including their prolongations in front of the first phalanx. The palmar wound or wounds are closed with the finest black silkworm gut. The finger still remains flexed at the first interphalangeal joint.

2. The hand is turned over so that the dorsal surface is uppermost, a semilunar incision is made over the first interphalangeal joint, the extensor tendon divided, the head of the first phalanx cleared to its neck, the latter cut across and the head dissected out.

3. The extensor tendon is slightly shortened and its two ends united, preferably with fine kangaroo tendon or Japanese silk, and the small dorsal incision, which is, of course, quite separate from the palmar one, is then sewed up. The finger should now become perfectly straight, or nearly so, with no tension whatever.

4. No splint is required in the after-treatment, the gauze dressing is a sufficient support, gentle active and passive movements should be resorted to within the first few days. No digit should be allowed to stiffen.

The author attaches equal importance to two points: the excision of the first phalangeal head and the avoidance of the prolonged and irksome splinting usually resorted to. The latter has been responsible for many stiff fingers and hands following the orthodox operations, and the author believes it is to some extent also responsible for the well-known tendency to recurrence of the contraction after them.

As to the incisions that have been used in dealing with the palmar fascia the author entirely rejects the wide excision of palmar skin as well as the V-Y method of a shifting flap. With the proviso that all scars in the palm may prove a slight drawback and should be made as short as is consistent with thorough dissection of the contracted bands, further that it is useless to lay down exact lines of incision for different cases, the following points are worthy of consideration.

1. The main incision must be linear and vertical, over or closely parallel to the ridges of palmar fascia. A small transverse incision at the front of the web may be needed, and any prolongation of the fascia in front of the first phalanx must be followed down and dissected out.

2. In the case of the middle or ring finger it is impossible to avoid placing the incision toward the midpalm. In the case of the little finger alone the incision may be made rather to the ulnar side of the hand, where the skin is more supple and less subject to pressure.

3. In closing the wounds the finest silkworm gut

(ophthalmic) should be used. It is rarely necessary to leave any raw area to granulate, especially if the head of the first phalanx has been excised and tension in the front of the finger thus removed.

Should a small plastic operation be required a tongue-shaped flap with its base upward might be taken from the side of the digit concerned and shifted over so as to lie transversely. As such a flap contains the whole thickness of the skin and its blood-supply, and is fixed in place by two or three fine sutures, it is much better than the epithelial grafts advocated in the textbooks.

The author also discusses the history of various methods of treatment, the anatomy and pathology, and the risk of after-treatment by continuous splinting, and closes with an interesting account of Dupuytren's life and surgical work. The paper is illustrated.

P. G. SKILLERN, JR.

Cooper, G.: Contractures and Allied Conditions; Their Cause and Treatment. *Brit. M. J.*, 1917, i, 109.

Certain joint deformities following military wounds are due to muscular contracture. Cooper attempts to differentiate two classes of such contractures: that in which the muscle-fibers are simply contracted, and that in which fibrotic changes have occurred. The conditions are distinct but may take place in the same muscle. Various theories of the process of contraction and relaxation have been given, but authorities agree that during contraction lactic acid is produced, and during relaxation it disappears. Apparently a nerve impulse is followed by the production of lactic acid in the fibril, fluid passes in from the surrounding sarcoplasm, and the tension developed results in shortening of the fibril. Thus an excess of lactic acid produces a contracture.

Contracture may follow prolonged immobilization of joints in flexed position, may be due to localized tetanus poisoning, or may accompany local or general sepsis (defensive spasm). Three stages of contractures are given: pure contracture, contracture with myofibrosis supervening, and fibrotic change without antecedent contracture. The first group is typically represented in lesions of the upper motor neurone where the hypertonus is obviously due to an increased flow of efferent stimuli. Practically all the muscles belonging to the first group tend to pass into the second group. Of the third group, the best example is the muscular condition found in cases of ischæmic contraction or Volkmann's paralysis.

Under treatment, prophylaxis is most important; passive and active movements should be undertaken as early, after necessary fixation, as injured joints or other tissues will allow, antitetanic serum must be given in suitable cases, systematic massage and manipulation must be given hypertonic muscles to prevent contracture, and splints may be used to control hypertonic groups. If, say, flexor groups are likely to have scar-tissue formation, the limb

should be immobilized until cicatrization has ceased. Curative treatment includes: active and passive movements accompanied by radiant heat, dry air, hot sand, or diathermy; adjustable splints to overcome deformity; various traction apparatus; and surgical intervention such as tenotomies.

R. G. PACKARD.

Mapes, C. C.: The So-called "Gonorrhœal Heel."

Am. J. Surg., 1917, xxxi, 34.

The statements of the textbooks to the contrary notwithstanding, the etiology of local congenital or acquired osseous developmental errors, as exostoses, osteophytes, bony spurs, etc., is still submerged in obscurity, although the traumatic or irritative theory appears to be the most reasonable. The present prevailing idea that the so-called spurs occasionally discovered by accident or otherwise on the os calcis might owe their origin to the invasion of the Neisserian diplococci was advanced by Jacquet in 1892. The author questions the use of the term "gonorrhœal heel" as he believes it to be inexact, inexpressive, and thinks that it should be eliminated from medical nomenclature.

He does not believe that it has ever been demonstrated that the Neisserian diplococci are capable of inciting hypernutrition with consequent exostosis, although he admits the systemic invasion of these micro-organisms. He further states that were it possible to isolate the diplococcus from the calcar pedis, or elsewhere, the causal relationship would not be established since exostoses have been encountered with greater frequency in patients who never have had gonorrhœa than in those afflicted with it. It has not been shown that exostoses in other situations have been the result of Neisserian infection nor has it been shown that the organisms have a selective action. It appears that there is no reported case of "gonorrhœal spur" in the female, though they are not immune to the infection. Finally, osteohelcosis rather than osteogenesis almost invariably follows such infections in bone.

GATEWOOD.

FRACTURES AND DISLOCATIONS

Korteweg: The Results of Dislocation of the Shoulder and Its After-Treatment (De gevolgen der Shouderluxatie en haar Nabehadeling). *Zentrabl. f. chir.*, 1916, No. 46, 926.

The author reviews the cases of dislocation of the shoulder which came under the observation of the government insurance department between the years 1904 and 1912. In regard to recovery he divides them into quick cures — 1 to 20 days, usual — 21 to 35 days, prolonged — 36 to 100 days; those which have not fully recovered their function after 100 days he considers bad cases. On account of the compensating ability of the body to take care of lesser grades of functional defect there is frequently a 20 per cent difference of opinion in regard to estimating the liability and compensation. He

therefore disregards all cases which have only a liability of 10 to 20 per cent if the ability to work is not reduced.

The treatment employed after the reposition is also important: immobilization and massage or immediate active and passive motion. Rest leads to organization of the intra and extracapsular functional disturbance. Massage in conjunction with rest can again lead to tears in the soft friable tissue and produce new bleeding and pain which necessitates more immobilization and its consequences. This treatment followed for many years must therefore be superseded by an active mobility treatment, which according to Marbaix produces much better results.

The author reviews the 845 cases in regard to all possible causes or influences, i.e., whether right or left-sided, direct or indirect dislocation, according to age, whether in city or country, in what period of industrial control, severity of the lesion, and from this hopes to find influences which may have a bearing upon the lesion and the result obtained.

The author's conclusions are: Indirect dislocations are as a rule mild cases and more frequently left-sided. Right-sided dislocations heal faster. This is not accidental. Fractures of the right upper extremity heal faster than those of the left side with the exception of the clavicle and fingers; whereas it seems that fractures of the left lower extremity obtain their complete function faster than those of the right side, and this is definitely proven for the bones of the feet. He explains this as follows: the right arm is the more active; there is a great desire to employ the right arm as soon as possible, yet it is necessary that the clavicle as a part of the arm carrying shoulder girdle obtain its full weight carrying ability before the arm is moved too freely. And these factors play an important part on the right side. The severity of the trauma is not as important as the manner of it; vessel and nerve complications are less frequent than supposed.

For the diagnosis of a nerve paralysis the author demands the presence of disturbances of sensation and the complete or partial reaction of degeneration. The fracture of the greater tuberosity is likewise rare but if present immediate extension with complete abduction is necessary. The so-called complications of dislocation of the shoulder, i.e., stiff shoulder, decided muscular atrophy, even of the entire arm, with bluish discoloration and thickening of the skin is the result of blood and lymph stasis and therefore should be prevented if possible. This is absolutely necessary as 10 per cent of all shoulder dislocations receive compensation and a further 10 per cent are able to resume their labor under considerable difficulty.

The results in Holland with the moderate duration of convalescence, 55 days, due to the Marbaix method, and complete recovery of some cases in 18 days are better than those obtained in the large German clinics. On that account the author is decidedly in favor of the Marbaix method. The

active motion instituted immediately after the reposition becomes more painless each time and favors absorption. Inflammation is prevented and perfect function is obtained before atrophy can set in. Movements with the aid of the healthy arm bar exercises, especially for abduction; lifting of a sand bag with the aid of a pulley, and like exercises act very favorably. The day after the injury and reposition work should be commenced, but of course in a very mild form. After eight days turning exercises during leisure hours are instituted. Psychic factors, initiated by the physician and directed into the proper channels, also play an important part. The article, everywhere critical and exact, presents a multitude of interesting facts and the appearance of further articles are awaited with interest.

L. A. JHUNKE.

Allison, M., and Dixon, E. K.: Congenital Dislocation of the Hip. *Interst. M. J.*, 1917, xxiv, 161.

The authors discuss the etiology and the pathologic anatomy of this condition before reporting their experiences in treating it by both the open and the closed method. They are inclined to believe the term congenital dislocation does not accurately describe the conditions involved; that there is no actual dislocation at the hip until the child begins to use the limb. This seems to be borne out by the fact that they had four cases in their series in which there was but slight displacement of the femoral head but marked abnormal laxity of the capsule at the hip articulation. The theory of La Damany seems plausible to them, namely, that intra-uterine pressure produces malformation of the femur and the acetabulum while the fetus is flexed *in utero* and that dislocation occurs only when the child unbends itself for the erect posture. In boys the shape of the pelvis, narrow below in proportion to its top, causes the acetabulum to be directed downward, while in girls it is proportionately broader below. This they think accounts for the greater prevalence in girls than in boys. Heredity is a small factor. The occurrence of other deformities, congenital in nature, is also noted, the most frequent being, in the order named, club-foot, genu recurvatum, spina bifida, and torticollis.

In discussing the pathologic anatomy the triangular shape of the acetabulum with its base below and its flat edges is described. They quote Durham who believes that anteversion up to 35 degrees probably will not interfere with maintenance of reduction, but more than this it is largely responsible for the number of anterior transpositions obtained after attempted reductions. The length of time required for full bony reorganization, sometimes six years, is emphasized. The fact that best results are obtained when the condition is early recognized is accentuated. Mothers should not be told that their children will outgrow an early painless limp.

They report 20 cases, 6 bilateral and 14 unilateral. Operative methods used were the forcible traction on the Bradford device. When this did

not accomplish the reduction speedily the Lorenz forced abduction method was used and in a few instances the procedure of Gwilym Davis was employed. The age varied from eighteen months to eight years. The last case was rather difficult but was reduced by the use of the Bradford device. In one case, aged 18 months, the neck of the femur was fractured. Results in all cases were excellent, stable joints being the rule. In several cases plaster fixation was employed for only six months.

The open method was used in 10 additional cases, 3 of which were male, 7 female; 8 unilateral, and 2 bilateral, the youngest 7 years, the oldest 25. Traction was applied by a strong ratchet pull applied to a boot on the foot. The anterior approach was used. When the capsule of the hip was reached care was always exercised to divide the thickened bands of the pubofemoral and the iliofemoral portions. With their free division reduction was never difficult, except in a few cases where it was necessary to exert a very powerful pull on the affected limb and at the same time tighten the pull on the sound side, so as not to allow the pelvis to tilt. If the acetabulum was cleaned of fibrous tissue no tendency was found to re-displacement. Strong internal rotation of the femur was necessary in several cases. The results in these cases were not so uniformly good as the closed, due to the more advanced age of the patients. In one double case, anterior transposition with improvement of function was secured. This also happened in two single cases, one 25 years old. Two other cases in which satisfactory reduction was secured had impaired function for a while due to injury to the sciatic nerve. Four cases were entirely satisfactory. One case was marred by an infection of the hip which resulted in a stiffened hip although the reduction had been satisfactory. There was also one other case in which reduction was satisfactory but at the end of six months full range of motion had not returned to the hip.

RALPH S. BROMER.

Phocas: Secondary Suture of a Fracture of the Upper Third of Femur in Full Infection (*Suture secondaire d'une fracture du tiers supérieur du fémur en pleine infection*). *Bull. et mém. Soc. de Chir. de Par.*, 1917, xliii, 522.

Phocas relates a case in a soldier who was wounded in September, 1916. The wound became infected but the Dakin installation could not be continued on account of tissue irritation. In October a cleansing operation was performed. The patient then had a temperature of 100.4 to 102.2°. After widely opening up the wound the bone fragments were found to be affected by osteomyelitis. A portion was resected and reduction of the fracture easily obtained. In these conditions the author risked suture of the fragments with silver wire.

Combined suture and ligature were used. The wound was then treated with magnesium chloride and continuous installations. Fever remained high for some time and then gradually fell to normal. In

December the wound was almost healed and the patient could walk with crutches. There was little shortening.

W. A. BRENNAN.

Andrews, E. W.: Fracture of the Patella Treated by Open Operation. *Surg. Clin.*, Chicago, 1917, i, 83.

Andrews emphasized that the essential lesson in these cases is the rupture of the anterior joint capsule in which the patella lies as a sesamoid bone. As the patellar fracture is a result of this tear, the operative treatment is directed to a careful repair of the capsule; the patellar fragments being incidentally brought together. In the technique the gloved hand touches neither the wound nor the portion of the instruments which enter it. All knots are tied with forceps. The drawings in the original show the use of a transverse incision over the center of the patella from condyle to condyle. If the joint is full of blood it is washed by a jet of warm sterile salt solution. Catgut or kangaroo tendon is used and interrupted sutures inserted beginning laterally over the condyle. The capsular ligament which so often falls between the bony fragments is lifted out and sutured. The skin is carefully approximated independently of the capsular repair. In the post-operative treatment no casts, braces, or supports are used but passive and active motions are begun immediately. The author states that if the sutures will not stand the pull of passive motion they will not stand that of the spastic quadriceps, even though in a cast. Synovial fluid has not escaped from the wound nor has it distended the knee in any of the author's large series of cases.

K. L. VEHE.

SURGERY OF BONES AND JOINTS

Mauclaire, P.: End-Result of Central Bone-Graft for Closed Tibial Fracture (Resultat éloigné d'une implantation osseuse centrale pour fracture fermée du tibia). *Bull. et mém. Soc. de Chir. de Par.*, 1917, xliii, 130.

A radiograph taken three years after a central bone-graft for a closed fracture of the tibia and fibula shows a peripheral hyperostosis of the tibia fusing the tibia and fibula. The graft is notably resorbed. From a functional point of view the patient walks very well.

W. A. BRENNAN.

Fromme, A.: Wedge Resection of the Knee-Joint (Zur Bolzungresektion des kniegelenks). *Zentralbl. f. Chir.*, 1916, xliii, 1001.

Sultan recently described a method of wedging the femur into the tibia for the repair of war injuries in which the lower part of the femur had been smashed. After resection of the crushed part he has inserted a wedge shaped femoral end into a cavity dug out of the healthy tibia and obtained good results. Fromme has carried out the method in a number of cases.

After a roentgen examination of the tibia the cavity is shaped out, and a corresponding piece from



Showing wedge resection of the knee-joint. (Fromme.)

the femoral-condyle is preserved to fill this cavity. The illustration shows the procedure sufficiently.

Healing of the bone is usually very quick, inasmuch as the wedge-prevents dislocation. No foreign tissue can insinuate itself between the bone surfaces. The method has the drawback that it causes a greater shortening than other methods.

W. A. BRENNAN.

Grégoire, R.: Treatment of Knee Injuries (Traitement des plaies du genou). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 39.

In treating knee injuries the great difficulty is to know whether the joint is infected or whether it may be considered as practically aseptic.

Grégoire affirms that there is only one means of knowing this, i.e., exploratory puncture. All other clinical signs are insufficient. The liquid withdrawn may have one of three aspects: (1) free pus; (2) clear fluid; (3) cloudy fluid. Each of these requires entirely different treatment. If the liquid is pus the articulation must be drained. The author prefers immediate resection, which he states gives better results than arthrotomy. When the fluid is clear only limited intervention is indicated, i.e., removal of incriminating foreign bodies, and of effusions from the joint by puncture; general revision of the wounded tract, and closure of the joint without drainage.

If the fluid is cloudy, one may be doubtful and tempted to rely on drainage. This would be an error. Drainage of the knee gives deplorable results. Grégoire employs the procedure just described and then desists. If the knee swells and the temperature rises and puncture is renewed. Grégoire has punctured as often as four times. Since May, 1916, he has followed this method in 96 knee wounds with only 4 failures.

W. A. BRENNAN.

Imbert, L.: Remarks on Bone-Grafting (Remarques sur la greffe osseuse). *Presse méd.*, 1917, p. 145.

In considering bone-grafting it is essential to distinguish two series of very distinct facts: If the freshened bony surfaces can be brought into

contact, bone-grafting is a very efficient method of effecting their union and solidification, perhaps better than osteosynthesis with metal plates; the number of successes will be considerable and will vary with the conditions of the fracture. But it can hardly be said that the piece of bone inserted is a graft in the true sense of the word.

It is different in cases in which there is an extensive loss of substance in the bone tract. It has been demonstrated that a graft will take in such circumstances; viz., it will live and share in blood circulation with the surrounding tissues and become a real graft. But it seems we cannot go farther and admit that a segment of bone so grafted is capable of taking an active and material part in the formation of a callus. A study of published cases of bone-grafts in pseudarthrosed areas with large loss of substance shows that the graft with the help of the nervous system acts only as an excitant to osteogenesis in one or both extremities. One or the other, sometimes both, extremity proliferates; their volume increases; they grow around the graft, and finally join each other, thus integrally repairing the loss of substance. If the two calluses thus proceeding from the fractured extremities join and fuse a true repair of the pseudarthrosis is effected.

W. A. BRENNAN.

Speed, K.: Tendoplasty for Wrist-Drop: Description of a New Operation. *Surg. Clin.*, Chicago, 1917, i, 187.

This operation is intended to alleviate the deformity of wrist-drop in permanent lesions of the musculospiral nerve, but is not expected to give a complete restoration of function. In temporary injuries to this nerve the tendoplasty prevents some atrophy and contraction of flexors and stretching of the extensors of the forearm.

The tendons of the flexor carpi radialis and ulnaris are split one-half at their wrist insertion; the free half is swung over the dorsum and fixed to the second and fifth metacarpal bones respectively. The hand is dressed and kept in complete extension by a Jones metal hand splint for three weeks. Using one-half of the tendon gives better balance and greater strength to the hand.

K. L. VEHE.

Beck, C.: Open Wound Treatment of Acute and Chronic Bone and Joint Injuries. *Surg. Clin.*, Chicago, 1917, i, 135.

In the treatment of bad acute and chronic inflammations of bones and joints the author states: "It is important, first, to remove the whole pathologic process; second, to provide sufficient external opening; and third, to maintain the external wound open by gauze packing changed at appropriate intervals until the whole cavity has filled in from the bottom." Occasionally large skin defects result which need grafts but these often close over nicely by the use of adhesive plaster strips.

K. L. VEHE.

Barnsby, H.: Fourteen Cases of Articular Wounds Treated in an Ambulance at the Front by Immediate Ether Disinfection of the Joint Followed by Total Suture of the Synovia Without Drainage (Quatorze cas de plaies articulaires traitées dans une ambulance de l'avant par la désinfection immédiate de l'article, à l'éther suivie de suture totale de la synoviale sans drainage). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1.

Barnsby gives an account of his treatment of articular wounds, especially the details of 14 cases treated in a surgical ambulance at the front within a few months. His previous experiences with arthrotomy and drainage did not give satisfactory results as recovery usually was with ankylosis. The procedure now adopted in the case of knee-joint injuries consists of radioscopic examination; large V-incision and wide systematic arthrotomy of the knee; section of the patellar tendon, alæ, capsule and synovia; withdrawal of synovial contents; removal of foreign bodies; curettement and tamponade of small osseous lesions such as fissures, etc.; treatment of any synovial injuries.

These procedures are executed while making every effort to obtain as perfect hæmostasis as possible. They are followed by ether lavage, the limb being successively placed in forced extension and flexion in order to cleanse the intercondylar space. The synovial is then totally sutured with catgut without being drained. When the joint is closed, the orifices made by the projectile are treated, the edges being resected and the soft parts of the trajectory incised as far as the synovial membrane and then sutured. The rotulian tendon and the alæ are reconstituted by sutures. The limb is placed in a plaster jacket for about fifteen days.

For the elbow, wrist, tibiotarsal and metatarsal joints, the operative stages are the same. Primary union has been followed by excellent functional power.

The procedure is limited to cases (1) of articular wounds without osseous lesion and with or without enclosed projectile; (2) articular wounds with limited osseous lesions, fissures, etc., with enclosed projectile. It is contra-indicated where the osseous lesions are extensive in which case resection is the method of choice.

Except in one case all of Barnsby's results have been excellent. He insists on the necessity of very early treatment.

W. A. BRENNAN.

Ashhurst, A. P. C.: Indications for the Iodoform Wax Bone-Filling of Moseitig-Moorhof. *Ann. Surg.*, Phila., 1917, lxx, 227.

Moseitig-Moorhof laid great stress on the proper preparation of a bone cavity before filling it with his iodoform wax. The operation must be done with Esmarch anæmia. Sterility is sought for by cutting away all unhealthy bone. This, though often tedious, is important in obtaining a good result. The cavity is then irrigated with 1 per cent formalin, or, if there is the least oozing of blood into the cavity, with hydrogen peroxide.

Originally a hot air blast was employed to dry the cavity, but the author states that unless the temperature of the air can be raised to 300°C., it cannot be sterilized in the short space of time it can be heated with a blast. He has not found radiant heat from a cautery more efficient, and has therefore contented himself with phenol, iodine, and alcohol for sterilization, and he dries the cavity mechanically. The cavity is not considered dry until the glistening appearance has disappeared. It is necessary for the wax to fill every crevice, blocking the minute blood-vessels which are exposed in the walls of the cavity. The wax, properly prepared by heating and thoroughly stirring, is poured very slowly into the cavity until the latter is absolutely full. Slowness is essential in the prevention of the entrance of air bubbles. After the mass has solidified the soft parts are sutured without drainage, but not too tightly to prevent the escape of exudation from the soft parts.

The author reports ten cases with excellent X-ray pictures in which the indications for and the advantages of the bone-filling plug are well shown.

GATEWOOD.

Lexner, E.: Rendering Stiffened Joints Mobile With and Without Interposed Tissue (Das Beweglichmachen versteifter Gelenke mit und ohne Gewebszwischenlagerung). *Zentralbl. f. Chir.*, 1917, xlv, 2.

Lexner says that the results obtained up to now in attempting ankylosis operations without interlying tissue strata are not to be compared with those obtained with their use.

Schmerz recently published a report of his method in which he considers the interposition of tissue superfluous. After reconstruction of the articular surfaces they are smoothed and polished so that the spongy interstices are filled with the detritus. It was found later that the new surfaces had become covered with tough membranous tissue which was partly cartilaginous, and gave good functional results. Lexner refers to his own attempts in the treatment of ankylosed joints which up to 1906 were failures. He then began the use of fatty tissue implantation (Murphy's method being known) and this gave better results. Various experimental work was carried out in this respect in his clinic till 1913, when Roepke, who also used the same clinical material, published his account of fatty tissue transplantation, particularly in the treatment of diseased joints.

Lexner points out that prior to Roepke's experiments he had experimented for a long time on fatty tissue transplantation in reconstructed joints. Transplanted fat tissue firmly unites with the bone surfaces of newly constructed joints from which it receives its nourishment and, by its power of regeneration, either forms a hard callosity where pressure and movement is exerted, or new fat tissue where mechanical irritation is absent. The joint action between the newly covered surfaces is perfect, with exact interlocking of the corresponding

parts. The fatty tissue becomes metamorphosed into a cartilaginous like joint covering which at the same time fills any irregularities in the joint surfaces.

The point then is, Should other procedures such as Schmerz' be discontinued? Lexner thinks that it must be determined if the Schmerz method of non-interposition would give functional results in fat transplantation which method offers less difficulty for the acquiring of joint motility and if the transformation of the fatty tissue is its only advantage. The first two points are not yet decided; but even at operation the fat tissue displays important attributes, inasmuch as it fills up irregularities in the joint surfaces, which fascia, periosteum, etc., fail to do; and further it efficiently prevents hæmorrhage.

Lexner is therefore of the opinion that both on account of its transformability and the attributes just alluded to, fatty tissue is the best material for interposition between ankylosed joints. There is very little real difference between a pedunculated fat transplant and a free transplant, inasmuch as the peduncle is usually so small and the flap so large that peduncular nourishment is slight.

Lexner refers to some of the inconveniences which may occur in the Schmerz method after the lapse of time, owing to changes in the denuded bone.

W. A. BRENNAN.

Nutt, J. J.: A Preliminary Report on the Use of Radium in Mobilizing Joints Having Fibrous Ankylosis Following Tuberculous Arthritis. *Am. J. Orth. Surg.*, 1917, xv, 137.

The author reports a series of six cases of fibrous ankylosis following tuberculous arthritis of the knee, treated with radium. Each case gave a positive von Pirquet reaction and a negative Wassermann test. He gives this preliminary report to encourage others to assist in determining the value of radium in orthopedic cases.

He employed the radium by means of the pad, the drinking water, and intravenous injections. No general effect was noted except that accompanying an excellent tonic. There were no deleterious effects. The results locally were more or less definite even before any mobility was observed. At first there was slight discomfort but never distinct pain. "Looseness" or lessening of stiffness was more noticeable in the mornings than it was after use. When movement began to be perceptible it was noted that the knee assumed a slightly flexed position and was straightened with slight difficulty. At no time was there any heat or swelling in any of the joints. Five diagrams indicate the amount of motion obtained in the cases treated.

The author states that if it is possible that the treatment can be hastened with perfect safety by giving larger doses or after some mobility is obtained and the patient is more or less saturated with radium that forcible correction may be done under anæsthesia without the danger which is usually present.

PHILIP LEWIN.

Zehbe: Bone Regeneration (Knockenregeneration). *Fortschr. a. d. Geb. d. Roentgenstrahlen*, 1916, xxiv, 1.

In 14 cases the author had an opportunity to observe the developments which took place after subperiosteal removal of a hollow bone. A subperiosteal resection of about one-third of the fibula was made for wedging of viciously healed fractures. Regular examinations made at certain intervals showed the progress which the substitute of the resected piece of fibula made, and showed moreover that the reconstruction of the bone progressed with different degrees of promptness in different persons.

In general, regeneration apparently progressed more promptly at the beginning than later on. Substitution of the resected bone-piece is not uniform but always begins and progresses from the proximal stump. On the distal end the regenerative tendency is very slight. A comparison of the length of the proximal callus with the distal callus shows on the average a proportion of 4 to 1. In the same way the principal development of the callus is upon the medullary part of the periosteal tube. This must, therefore, offer more favorable conditions for regeneration than the lateral.

For these peculiar results the author gives this explanation: In the described cases it was ascertained without exception that new bone development in the proximal as well as in the distal stump is strongest in the medullary part, therefore on the side which lays nearest the principal blood supply. Something similar is known from general anatomical developments. Thus in the foetus, the organs which are nearest the umbilical vein develop first, viz., the liver, the heart, the head, then the extremities. The same conclusion seems consistent in the case of bone regeneration, that is to say, that it is distance from the blood stream which causes the dissimilarity in the rate and amount of the regenerative tendency in bone.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Mayer, E.: Adaptability of a Child with both Forearms Amputated (Geschicklichkeit eines an beiden Unterarmen amputierten Kindes). *Zentralbl. f. Chir.*, 1916 No. 46, 922.

Mayer demonstrated a child, 9 years old, who had both forearms amputated, the left entirely and the right two-thirds. The amputations had been performed at the age of one and one-half years. The child can write excellently and can help itself very nicely. For eating it uses a spoon held between the forearm and its shirt sleeve.

The author emphasized the importance of saving every millimeter of stump possible for the attachment of a good artificial limb.

L. A. JUHNKE.

Forbes, A. M.: Poliomyelitis as Seen by the Surgeon. *Canad. M. Ass. J.*, 1917, vii, 119.

The etiology, morbid anatomy, clinical aspects, and treatment of infantile paralysis are discussed. The

author believes that all parts of the spinal cord and the surrounding tissues are affected by the inflammation which is followed by degeneration of the nerve-cells and nerve-filaments, resulting in paralysis of certain groups of muscles.

Paralysis is followed by deformities which are due to:

1. Death of the nerve-cells, producing a permanent paralysis.

2. Pressure on, or interference with, the nerve-cells, producing a temporary paralysis.

3. Stretching of the muscles or tendons, producing a pseudoparalysis.

4. Contractions due to unopposed muscular tone.

The treatment during the regenerative stage should be protective; the operative procedures should be deferred for at least two years.

R. B. COFIELD.

Ogilvy, C.: Dont's in the After-Care and Treatment of Infantile Paralysis. *N. Y. M. J.*, 1917, cv, 305.

Don't lose sight at any time of the pathological changes taking place. At first there is a general systemic infection. Associated with this infection there is an involvement of the cerebrospinal axis. This is then an acute interstitial meningitis.

We have, as a result of the infection, cellular exudate, œdema, and hæmorrhage. These circulatory disturbances, either by reason of direct mechanical pressure or a diminution of the blood supply to the nerve-cells, cause a lack of nutrition which, if continued long enough, results in degeneration and necrosis. Still another factor in bringing about this result is the toxic action upon the nerve-cells by the infectious virus.

Don't limit these observations to the acute stage only, but extend them over the entire period of convalescence, which may last for years. Only with this pathological picture in mind can we fully appreciate the symptoms as they develop, and, what is of more importance, treat intelligently the resulting paralyses.

Don't fail to emphasize the importance of absolute rest and quiet during the first three months. Nothing is gained by massage, manipulation, or electricity during this period; the patient should be kept at perfect rest.

Don't use complicated or cumbersome means when simple ones are at hand. Paralyzed limbs may be put at rest most easily by the application of a light plaster-of-Paris bandage applied over cotton. Complete rest, so obtained in this early stage, promotes absorption, relieves irritation, and diminishes pressure.

Don't forget that the two main objects of all treatment are the regaining of lost muscle power and the prevention of deformities. The one is fully as important as the others.

Don't begin massage too soon. The best results are being obtained in those cases which have not

had any massage until the fourth month after the acute attack.

Don't underestimate the value of muscle-training exercise. At the same time, don't overfatigue a muscle or group of muscles at any time by any exercise or muscle activity. Muscle training must be conscientiously, thoroughly, and consistently carried out. It should be a daily routine and arranged for as part of the patient's daily work.

Don't overbrace. Don't underbrace. Braces should be applied when deformities would otherwise occur because of insufficient support or because of a stronger group of muscles overacting against the weaker or paralyzed group. Of such deformities hyperextension of the knee-joint and drop-toe most frequently result. Correct braces, if properly adjusted and carefully applied, should not in any way interfere with muscle development; indeed, the contrary is apt to be the case.

Don't overlook the spine. When the muscles of the back are weakened by paralysis it is often a unilateral affection. The result is a lateral curvature of the spine.

Don't omit bath exercises. These active exercises, which I cannot recommend too highly, and which will give most encouragement to the patients, are those taken in a warm bath with the tub filled with water sufficient to immerse the body.

After the sixth month electrical vibratory massage is also recommended. This should be applied over the spine at either side of the spinous processes. Heat is always beneficial in stimulating circulation and so aiding the nutrition of the part. Heat, both as to degree and intensity, can be applied most readily by an electric light bath.

Don't expect a great deal from the use of electricity. The benefits derived from the use of electrical stimulation in the treatment of these cases have been overestimated. Electricity, of itself, neither prevents deformities nor does it cause muscle power to be regained.

Don't fail to see from time to time those patients who have apparently recovered from paralysis. Many patients who seem to have recovered perfectly have been left with a slight weakness in one or other group of muscles in the lower extremities, or in the back. If so watched, muscle weakness can be detected and deformities be prevented. For at least a year, don't discontinue the supervision of these cases which have had a slight paralysis from which they seem to have recovered.

Don't give a too discouraging prognosis. Those who have been treating cases of anterior poliomyelitis during the past few years have learned that much can be done in severe cases even after one, two, or more years have elapsed. There are few patients indeed that cannot be enabled to walk even though apparently completely paralyzed at the onset.

Don't operate for any reconstruction of muscle power for at least two years after the acute attack. The only operative treatment that is justifiable during this time is that of straightening deformities.

Kleinberg, S.: The Orthopedic Treatment of Infantile Paralysis. *N. Y. M. J.*, 1917, cv, 207.

Infantile paralysis shows three stages: acute, convalescent, and chronic. It is primarily a disease of the cord, resulting in muscular paralysis which produces joint malposition from force of gravity or unopposed action of antagonistic muscles. This malposition produces contraction on the active side, and stretching of tissues on the paralyzed side. The contractures become more and more resistant with time and often produce serious deformities if not treated. The most serious element is the stretching of the weak muscles because so frequently they are only partially paralyzed and if forcibly held in relaxation would go on to ultimate recovery. Therefore, treatment includes rest in the acute stage, prevention of malposition and deformity, and assisting paralyzed muscles to recover. To prevent deformity, proper position is necessary, and apparatus of one sort or another may be indicated, whether made of wire splints, steel or iron braces, starch or plaster bandages. A paralyzed muscle may be aided in several ways; relaxation, preferably by apparatus; massage to produce mechanical stimulation, to improve the circulation, and to maintain tonus; muscle training which consists in the attempt to force a nerve impulse from the brain to the muscle; and possibly, but not probably, electricity.

In the upper extremity, the most common condition is paralysis of the deltoid and external rotators of the arm—here the arm must be maintained at a right angle. In paralysis of any trunk muscles, scoliosis must be looked for and may be prevented by placing the child on a frame or in a brace or cast. In the lower extremity, the most common conditions are either complete paralysis of the entire limb or leg or foot, or simply a flexion contracture of the hip, or knee, or a drop-foot. Such conditions may be avoided by holding the limb in a neutral position if completely paralyzed, or in an over-corrected position if partially paralyzed. In the chronic or stationary stage, actual contractures or deformities are treated by tenotomies, fasciotomies, tendon-transplantations and implantations, arthrodeses, astragalectomies, etc. R. G. PACKARD.

Taylor, H. L.: Results of Research on Conditions Affecting Posture. *J. Am. M. Ass.*, 1917, lxxviii, 327.

The authors report their experience with forty cases of internal bone-splinting by both the Albee and the Hibbs methods, each of which gave good results in the cases where used.

Recoveries were good except in the cases with pulmonary or second joint involvement. Three cases with paraplegia have recovered and two died. In the cases with abscess formation there was complete subsidence of abscess. Postoperative fixation should be maintained for a period of at least one year to insure the best result. Unless the complications are of a very severe nature the operation is indicated as soon as the diagnosis is made, especial-

ly in adult cases, where the conservative measures are very slow and unsatisfactory as compared with the results of operation. C. L. HALL.

Porter, J. L.: Some Painful Affections of the Feet. *Illinois M. J.*, 1917, xxxi, 110.

The author recognizes three degrees of foot troubles: (1) weak-foot, anatomically normal but flattens on standing; (2) flat-foot, in which the arch is flattened when the patient is not standing, active supination is lost and passive supination is painful; (3) rigid foot, which cannot be either actively or passively supinated. General etiological factors are given as muscular weakness, traumatism, disproportion between the strength of the feet and the weight of the body, long-continued standing in improper shoes, chronic gastro-intestinal toxæmia, acute infections including typhoid, tonsillitis, and gonorrhœa.

In the treatment of very painful feet rest is an

important factor. The rest must be absolute to be effective, for if the patient takes even a few steps a day he forfeits much of the benefit secured by the twenty-four hours' rest. By supinating the foot all the over-stretched muscles and ligaments are relieved and no treatment can be of much value which does not maintain this position. It is the author's custom to supinate all cases, using any means necessary including tenotomies, osteotomies, excisions, or osteoclasia. After preliminary treatment the arch is supported either by carrying the shoe heel forward and thickening it on the inside, and inserting soft felt pads, or by the use of a metal arch support made over a plaster model of the foot. In all except rigid feet exercise consisting of rising on the toes and supination is beneficial. In metatarsalgia (Morton's toe) the exercise should consist of curling the toes downward over the corner of a chair or picking up marbles with the toes.

W. A. CLARK.

SURGERY OF THE SPINAL COLUMN AND CORD

Jacobs, C. M.: Compression Paralysis of Pott's Disease in Adults. *J. Am. M. Ass.*, 1917, lxxviii, 509.

Paraplegia in adults with Pott's disease is due to intraspinal abscess in the majority of cases as reported by Jacobs, who found twenty-four cases in a series of seventy-five cases of adult Pott's disease.

In children the compression is more frequently due to granulation tissue, and the prognosis under rest is favorable. Treatment such as fixation and bone grafts were of little avail, as was laminectomy.

Pulmonary complication caused the majority of the fatalities. Prognosis in adults was almost always bad, although there were cases which had recovered, either wholly or partially. C. L. HALL.

Eisendrath, D. N., and Schram, D. L.: Acute Osteomyelitis of the Spine. *Ann. Surg., Phila.*, 1917, lxxv, 147.

There are only a relatively small number of cases of osteomyelitis of the spine in the literature, probably because a diagnosis is not made. Donati, in a thorough review of the subject, collected 56 cases up to 1906 including one of his own. Up to 1914, Volkmann was able to collect 84 cases. Cases of sacral osteomyelitis are not included as they do not allow the escape of spinal fluid and because the lateral portion of the sacrum (the most frequent part involved) corresponds embryologically to the ribs.

Most cases occur between the tenth and twentieth year. The most frequent etiological factor is the presence of a suppurative focus elsewhere. According to Donati the lumbar region is most frequently involved, but Volkmann found the greatest number in the dorsal region. Several vertebrae are involved as a rule. Involvement of the body is

more often followed by invasion of the cord and the development of peripleuritic and psoas abscesses than that of the arch. The mortality is high and generalized sepsis often occurs, sometimes with death before a diagnosis is made. In the cases in which the infection is not too severe, rigidity of the affected portion of the spine and marked pain are of great value in making a diagnosis. Severe pain due to pressure of the nerve-roots rarely occurs except in the cervical region. The escape of pus into the canal may result in extradural abscess formation with symptoms of meningeal irritation as in the case reported by the authors, or in pressure upon the cord with symptoms of compression at the level involved, or in a purulent meningitis. Operative interference to be effective must be early, but unfortunately in one-third of Volkmann's collected cases the condition was unrecognized.

The authors report one case with recovery. They believe that the disease is not so rare as the statistics would lead one to believe and that as the disease is recognized the number of cases will rapidly increase.

GATEWOOD.

Neuhof, H., and Climenko, H.: Some Experiences in the Surgery of Non-neoplastic Lesions of the Spinal Cord. *Hosp. Bull. Dept. Public Charities, N. Y.*, 1917, i, 43.

The conclusions which the authors reach from the consideration of four operations upon non-neoplastic lesions of the spinal cord are as follows:

1. The operative risk of laminectomy should be practically nil.
2. The possibility of making conditions worse by laminectomy should be practically nil.

3. Laminectomy, combined with incision of the dura, may, in itself, objectively and subjectively, improve the condition of the patient. The reason for this is not known at the present time.

4. The diagnosis of the nature of a spinal cord

lesion is often obscure when the determination of its level is not difficult.

5. Therefore, laminectomy is justified in all doubtful cases presenting evidences of spinal cord disease with signs of level pressure. J. H. SKILES.

SURGERY OF THE NERVOUS SYSTEM

Spelthahn: A Case of Hydromyelia (Ein Fall von Hydromyelia). *Zentralbl. f. Chir.*, 1916 No. 46, 923.

The patient was a man 46 years old who had strained himself by overlifting in January, 1916. Following the injury the patient complained of pain in the back and in the region of the stomach. In May some difficulty in urinating and progressive paresis of both legs developed. In June spastic paresis of both legs and complete anaesthesia from the eighth dorsal segment downward, was demonstrable, and urine had to be voided per catheter. Wassermann was negative. There were no lesions of the spine; X-ray picture showed nothing abnormal. An operation was performed. The spine was laid bare from the fourth to the eighth dorsal segments. In the region of the sixth to the eighth dorsal segments of the cord the cord was found to be thickened and spindle shaped; there was an oedematous swelling, and the central canal was enlarged and spindle shaped. The posterior commissure was divided longitudinally and a canal formed between the dilatation and the subdural space. In connection with the operation a fistula formed which closed spontaneously within two weeks. Seven weeks after the operation sensation had returned partially over the posterior left gluteal region and over the left leg. The left hip and femoral musculature had begun to functionate slightly. Reflexes in the left leg were increased. The right leg was completely limp, paralyzed, with decubitus over the right trochanter and over the right heel. Further progress is awaited.

In the discussion TILLMAN expressed his belief that the case probably was a localized dilatation of the central canal as a result of extravasation of blood at the time of the trauma. The established canal may act similar to the puncture of the corpus callosum. The improvement after a stationary period is interesting at any rate. L. A. JUHNKE.

Von Lorentz: The Treating of Nerve Injuries (Nervenverletzungen und deren Behandlung). *Beitr. z. klin. Chir.*, 1916, c, *Kriegschir. H.* 16, 248.

Von Lorentz recommends that immediately following a nerve injury, the joint should be placed in such a position that the nerve is subjected to the least amount of strain. The elbow-joint should be flexed in injuries of the median nerve; similarly in paralysis of the ulnar nerve the fingers should be spread apart and all joints flexed; the knee-joint flexed in injuries of the sciatic nerve and so on.

Even with a very exact neurological examination it is not possible to obtain a correct demonstration of the nerve injury. Hence, presuming that the wound has healed, if after three months reaction of degeneration exists, or if there is a reduction in the already diminished electrical excitability, operation should be done. Persistent limited severe neuralgia is also an operative indication.

The choice of general narcosis or local anaesthesia is governed by the indications of each individual case, and the mode of operation depends upon the changes found. If outwardly there appears but slight injury the epineurium should always be opened. If there are internal changes it requires an exact knowledge of nerve topography before proceeding.

If resection is necessary, the nerve stumps should if possible be joined by direct suture. The author prefers the use of fatty tissue to protect the sutured part.

The after-treatment is most important. The author describes a modification of the Spitzzy apparatus for radial paralysis which can be used till nerve-conduction is re-established. Hot-air, massage, electric treatment, and suitable exercise are all to be used and give good results. Detailed reports of treated cases with illustrations are given.

W. A. BRENNAN.

Mercadé, S.: The Subperitoneal Route for Extraction of Paravertebral Projectiles (La voie sous-péritonéale pour l'extraction des projectiles paravertébraux). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 176.

The extraction of projectiles situated at either side of the vertebral column in front of the transverse process is not easy.

Mercadé has used the subperitoneal route in the extirpation of the lumbar ganglia in the lateral planes of the spine. The peritoneum is easily exposed, the intestines avoided, and a very large opening made in the posterior abdominal plane. Mercadé does not know whether this route has been used for extraction of paravertebral projectiles, but his own attempts in this way have been successful. Projectiles lodged in the iliac fossæ more or less remote from the posterior median line can be easily extracted by this route. He has extracted two rapidly, ligating the external iliac.

For paravertebral projectiles it is sufficient to prolong the operative incision, following a line

starting from the anterior and superior iliac spine and ascending parallel to the abdominal border. After incising the muscles the peritoneum is reached and carefully exposed. The incision is then progressively toward the median line. The posterior parietal peritoneum is thus laid bare as far as the median line, thus providing a considerable opening to seek the projectile. The method has the advantage of allowing a very clear view in a deep region where the smallest injury to any of the important organs may be attended with very serious complications.

W. A. BRENNAN.

Kirk, E. G., and Lewis, D. D.: Regeneration in Peripheral Nerves; an Experimental Study.
Bull. Johns Hopkins Hosp., 1917, xxviii, 71.

In a previous communication it was shown by the authors that nerve defects may be bridged successfully by tubulizing with an autotransplant of fascia. Although devised primarily with reference to practical surgical use, it soon became apparent to them that the method afforded unusual opportunities for a study of the histology of nerve regeneration following mechanical trauma. The defect was produced by excising a segment, varying in length from 1 to 3 cm., the nerve being cut squarely across with a sharp knife. Fascia lata from the same animal was used to construct the tube, since by using an autotransplant fibroblastic reaction and subsequent cicatrization were avoided. Thus regeneration following trauma could be studied without interference from various external factors and in particular the ingrowth of cicatricial tissue between the ends. Most important of all, the comparative behavior of proximal and distal stumps was more easily determined than when the ends were approximated.

The material used in the present report included 41 sciatic nerves of adult dogs, 21 of which were in complete serial section. The animals were killed at periods varying from one day to 36 weeks after operation.

The various methods of histological preparation for the study of the tissues are described by the authors in this paper. In conclusion they state that in the immediate vicinity of nerve trauma associated with break of continuity there occurs an accelerated hyperplasia of the neurilemmal elements which results in the early formation of protoplasmic bands, which develop in both the proximal and distal stumps and tend to bridge the defect. Along these protoplasmic pathways the regenerating axis-cylinders from the central stump pass. Whether they reach the distal stump and neurotize, the authors state, depends largely on the extent to which these preformed conduits have prepared the way.

All efficient regeneration of nerve-fibers (axis-cylinders) is from the central stump, the authors believe, and all regenerating nerve-fibers, whether the outgrowth of medullated or of non-medullated axones, are in their early stages non-medullated.

They found that all medullation began proximally and proceeded distally, appearing only in those

parts of the new axis-cylinder which had acquired an age of five or five and one-half weeks (in the dog).

GEORGE E. BEILBY.

Hofmann: Operations on the Peripheral Nerves
(Unsere Erfahrungen mit der chirurgischen Behandlung der Schussverletzungen peripheren Nerven).
Muenchen. med. Wchnschr., 1916, No. 34, Aug. 22.

Hofmann's report deals with the results of 74 operations on peripheral nerves carried out by Krueger in Reserve Hospitals from October, 1914, to January, 1916. There were 40 nerve sutures and 34 nerve liberations from compression due to cicatrizations. Of the sutures 23 were in nerves of the upper limbs: 13 on radial, 5 on median, 4 on the ulnar, 1 on the musculocutaneous. There were 17 sutures made on the lower limb nerves: 9 on the popliteal, 6 on the sciatic, and 2 on the tibial and crural. Of the liberations, 25 were on the upper limb nerves: 8 on the median, 7 on the radial, 5 on the ulnar, 4 on the brachial plexus, 1 on the musculocutaneous. There were 9 liberations of the lower limb nerves: 4 of the sciatic, 4 of the popliteal, and 1 of the tibial. Most were caused by rifle bullets.

The indications for surgical intervention are: (1) complete motor paralysis with total reaction of degeneration; (2) partial motor paralysis, when after 2 to 3 months conditions remain unchanged or worse; (3) severe sensory irritative symptoms in the domain of the nerve which do not improve under treatment; (4) trophic disturbances, especially retardation of healing of wounds in the domain of the affected nerve.

The most suitable time for intervention is decided by the following indications:

1. The wounds caused by gunshot and their complications must be quite cured, as a good result of nerve suture cannot be hoped for unless in aseptic conditions. Even after apparent recovery germs may still be vital in a cicatrix, especially in fracture cases, and in such cases it may be necessary to delay intervention for eight or nine months until complete recovery and an aseptic condition is quite assured.

2. Cases in which a grave nerve lesion is evident should be operated upon as soon as possible after recovery of the wound. Within 2 months 15 such cases were operated upon.

3. All other cases should be operated on after a period of two to three months if there is no improvement in the nervous disturbances. Forty-seven such cases were operated upon two months or more after injury.

In technique the following points require attention: to approach the nerve with the least injury of soft parts; to respect the muscle nerve branches; rigorous hæmostasis using Esmarch's band; to proceed under general anaesthesia.

In 58 of the cases the author practiced wrapping of the sutured tract or of the parts of the dissected nerve in a piece of free transplanted fascia lata taken from the thigh of the patient; it is necessary to include a large part of the aponeurosis in wrapping

the nerve in order to avoid the following retraction which is always observed with nerve compression and its consequences. The wrapping fascia is fixed by suturing its margins together, and its extremities are sutured to the surrounding tissues. The author thinks that merely placing the nerve in the midst of muscular tissue is not the method of choice and refers to a case operated upon by others in which the sciatic nerve was so treated. The patient showed grave sensory irritative phenomena with advanced atrophy and flexional contracture. Having freed the nerve which he found adherent to the muscle, the author wrapped it in a fascial transplant and after three weeks the pain had disappeared and the patient could move the limb.

Of the end-results only a few particulars can be given owing to the necessity of clearing the patients. In 11 cases of suture he had good results with return of function in periods varying from two to twelve months. In 7 cases the results were uncertain; 4 gave no results; and in 8 the time after operation is too short to give an opinion. In the 19 cases of nerve liberation, 14 were successful, 2 doubtful, 3 gave no results.

W. A. BRENNAN.

Lewis, D. D.: Neurolysis and Nerve Suture. *Surg. Clin.*, Chicago, 1917, i, 103.

The author presents four cases of nerve injury: a gunshot wound of the outer cord of the brachial

plexus; a tear of the external popliteal in compound fracture; and two median nerve injuries, both in the lower part of the forearm resulting from cuts. One of these was accompanied by ulnar nerve section.

In nerve-trunk injury early exploratory incision and repair are advocated. An analysis of statistics shows that early cases yield the best results. Decalcified bone tubules, iodoform gauze, hardened gelatin tubes, and hardened blood-vessels of calves are discarded as unsatisfactory agents to prevent nerve adhesions at the site of repair. Fascia and fat only are considered useful possibilities, with the latter the favorite. Contraction of fascia will occur if placed between recent scars. Fat heals in place with little reaction and practically no permanent adhesions.

End-to-end suture or tubulization gives better repair than lateral implantation. The scar must be excised to normal axis cylinders as indicated by a granular surface on the nerve-end before repair is done. To effect the approximation of nerve-ends in the case of external popliteal injury the leg is flexed slightly. Three fine silk sutures are used to approximate the ends, and then a free fat transplant is placed around the line of union. This is stitched to complete the tubular form and then fixed by suture to adjacent tissues to prevent its slipping on the nerve-trunk. In all cases the muscles supplied by nerves injured must be so dressed as to be free from tension.

K. L. VEHE.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Porter, W. T.: Fat Embolism a Cause of Shock. *Boston M. & S. J.*, 1917, clxxvi, 248.

In a study of traumatic shock at the allied front Porter found that an undoubted relation existed between shock and broken bones, particularly when the bones were large, as the femur. From the nature of the wounds considerable areas of bone-marrow were frequently exposed in such a way as to favor absorption.

It is known that extracts of bone-marrow when injected into a vein do not seriously disturb the circulation. Porter found, however, by eight experiments on cats that the injection of fatty substances into the jugular vein induced a clinical picture essentially similar to traumatic shock in human beings.

He draws the following conclusions:

1. Fat, often in large quantities, is known to enter the blood-vessels in traumatic shock, the essential feature of which is a characteristic fall of blood-pressure.

2. A similar fall, with the same resultant symp-

toms of shock, may be produced experimentally by injection of fat into a vein.

3. Fat in the blood stream is known not to be injurious *per se*; its injurious effects are the product of fat embolism.

4. Fat embolism is a cause, though not necessarily the only cause of shock after fracture of the bones.

A. EHRENFRIED.

Waterman, A. H.: Focal Infection and Inebriety. *J. Ophth., Otol & Laryngol.*, 1917, xxiii, 100.

The following explanation of the etiological relationship between focal infections and inebriety is offered: "The focus of infection acts as an incubator, and the patient suffers from chronic systemic illness with the result that he is anæmic, complains of chronic fatigue, has many nervous symptoms and even mental instability. He is not 100 per cent efficient. In endeavoring to secure relief from a condition which he fails to recognize as illness, he attempts to be his own physician and uses highballs to stimulate and bromo-seltzer to dull." To successfully treat these patients, teamwork between the internist and specialist is advised.

OTTO M. ROTT.

SERA, VACCINES, AND FERMENTS

Ottenberg, R.: The Reliability of the Wassermann Reaction; a Study of the Sources of Error and an Attempt to Standardize the Technique. *Arch. Int. Med.*, 1917, xix, 457.

Divergent reports on identical serums sent to different laboratories occur and will continue to occur so long as laboratory workers continue to use widely different technical methods. These divergent results, however, should not lessen confidence in the clinical specificity of the Wassermann reaction. They almost invariably occur in cases which exhibit weakly positive reactions, and they usually mean that one laboratory has succeeded in detecting a weakly positive reaction, while the other has not. In the great majority of cases which present definite positive or definite negative results the reports of different laboratories are practically uniform. The reason for the divergence in the results on weakly positive cases is that some laboratories have adopted certain refinements of technique which other laboratories have for various reasons failed to adopt. The original Wassermann technique, while safe in the sense of not giving false positive results, is not nearly so delicate in detecting positive tests as it can be made. There are so many pitfalls in the performance of the Wassermann reaction, that, while the technique may be seemingly easily learned, the inexperienced operator may obtain many erroneous results. MAX KAERN.

BLOOD

Schneider, J. P.: The Hæmatopoietic-hæmolytic Index—a Proposed Determination Helpful in the Differential Diagnosis of Types of Pernicious Anæmia Amenable to Cure by Splenectomy. *J. Lancet.*, 1917, xxxvii, 105.

To gain additional information relative to whether a given anæmia is actually splenic in origin, and if so, to establish the state of the latter, the author has in the past two years studied the severer anæmias from the viewpoint of the duodenal blood-derived pigments.

From a total of 81 studies in 59 cases, 20 were cases of pernicious anæmia of which 7 were splenectomized.

To definitely decide how much destruction still overshadows marrow inc ompensation and to confirm the probable efficacy of splenectomy, the author proposes that the hæmatopoietic-hæmolytic index be ascertained—thus: the H-H index = $\frac{Z+Y}{X}$ in which Z represents the thousands, including the first decimal of the total pigment values as determined quantitatively by the spectroscopic method, Y the same of the blood-count in round numbers, and the value of X, 6. To illustrate: in a given case with the total pigment values around 5,400, the blood count 1,500,000, the H-H index is $\frac{5.4+1.5}{6} = \frac{6.9}{6} = 1.1$, which is a plus index.

In another case the total pigments are 2,200, the blood count is 1,500,000, the index $\frac{2.2+1.5}{6} = \frac{3.7}{6}$, or 0.6—, which is a severely minus index.

In the former case so much pigment could not be obtained unless the marrow still supplied the raw material in great abundance.

In a series of 20 cases, only 7 yield a plus H-H index, while 2 approach an index of one. Of these 7, 3 have been splenectomized with apparently more than the rather usual temporary improvement. However, since less than a year has elapsed since splenectomy, judgment is still withheld. The author concludes, nevertheless, that splenectomy should be reserved for the cases presenting favorable clinical features and a plus H-H index.

LUCIAN H. LANDRY.

BLOOD AND LYMPH VESSELS

Sinkowitz, S. J., and Gottlieb, I.: Thrombo-Angiitis Obliterans; the Conservative Treatment by Bier's Hyperæmia Suction Apparatus. *J. Am. M. Ass.*, 1917, lxviii, 961.

An ordinary Bier's suction cylinder is used, the rubber cuff being attached to the open end of the cylinder fitting snugly around the ankle. Twenty ambulatory cases were treated by this method and all but one were affected favorably and the subjective symptoms improved. Ulcerations present in two of the cases were not healed at the time of this report but were shallower and smaller and the pain had disappeared altogether. No return of pulsation was noticed in any of the vessels in which the pulse was not palpable at the beginning.

The conclusions are as follows:

1. Admitting that many cases run a progressive course, the only treatment for which is amputation, the authors still firmly believe in conservative treatment for the majority of cases.

2. The various measures resorted to in the conservative treatment of this disease have proved in the majority of cases, to be of only temporary value or of no value at all in alleviating the symptoms.

3. The hyperæmia suction treatment gives results unsurpassed by any other method available.

4. The beneficial effects observed are: increased warmth of the parts, improvement of the color, alleviation of the pain, and more rapid healing.

5. Although occasionally a patient may not respond to this treatment, and some cases are too far advanced to be benefited by it, the improvement observed in the vast majority of cases is so evident that the authors firmly believe that this method deserves a definite place in the conservative treatment of thrombo-angiitis obliterans.

CARL R. STEINKE.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

MacCarty, W. C.: The Pathologic Reasons for the Legitimate Error in X-Ray Diagnosis of Gastric Carcinoma and Ulcer. *Am. J. Roentgenol.*, 1917, iv, 67.

The author reaches the following conclusions on the subject:

1. There is no macroscopic differentiating structural difference between a simple chronic gastric ulcer and an early carcinomatous chronic gastric ulcer.

2. There is no differentiating variation in muscular structure which might be the basis of diagnostic difference in gastric rhythm in simple chronic gastric ulcer and an early carcinomatous chronic gastric ulcer.

3. The diagnosis of early carcinoma in the border of a chronic gastric ulcer is a question of the position of a few undifferentiated epithelial cells in the mucosa or submucosa and it still remains an open question whether or not the X-rays can differentiate such small quantities of such cells from normally differentiated epithelial cells or the cells of the other tissues in a chronic ulcer.

The article is profusely illustrated with photographs of specimens and microphotographs, and further confirms the popular contention that a roentgenologist can not be expected to differentiate, from the study of shadows, the pathologic nature of a lesion which it is necessary to examine microscopically to determine whether it is a simple chronic gastric ulcer or an early carcinomatous gastric ulcer.

W. A. EVANS.

Rollier, A.: Sun and Air Treatment of Non-tuberculous Surgical Diseases Including War Injuries (Sonnen und Luftbehandlung nichttuberkulösen chirurgischer Affektionen mit Einschluss der Kriegsverletzungen). *Beit. z. klin. Chir.*, 1916, c, Kriegschir. H., 149.

Rollier has observed that wounds of mountaineers heal remarkably fast and has turned his attention to the sun and altitude treatment of non-tuberculous surgical diseases.

In contusions without external wound, tissue nourishment is hastened, the resulting active hyperæmia facilitates resorption of serous fluid, and stimulates phagocytosis in the region of the coagulum. In contusions the sun exerts its bactericidal properties, and induces phagocytic resorption and elimination. Sun treatment has the advantage over occlusion treatment that the foul odors, etc., connected with change of bandages do not exist.

In suppurating wounds (1) heliotherapy acts through its bactericidal and drying-out properties; (2) through the strengthening of the vital functions of the tissues; (3) through natural, profuse drainage and cleansing of the wound.

To facilitate secretory flow of such wounds, the injured region is placed in the most nearly vertical position. In sun treatment of varicose ulcers we notice first: (1) relief from pain; (2) a cleansing, eliminating action which shows itself by increase of pus secretion. In dirty, greasy ulcers, elimination of the necrotic tissue occurs. As the cleansing of the ulcerous region progresses, the character of the pus secretion changes into a seropurulent and then into a clear serous fluid, within the space of from three to ten days; (3) a hardening action; (4)

resorption of œdema and surrounding infiltrations. Ulcers of traumatic origin in this manner become cicatrized within three weeks, very old, eczematous ulcers in from four to six weeks, and at most nine weeks.

In conjunction with specific treatment, heliotherapy accelerates the healing of luetic ulcers. In bone fractures of the upper extremity, a certain amount of consolidation was awaited before exposure to the sun, but in lower extremity fractures sunning was begun at once. Heliotherapy, conjointly with the usual fracture treatment, favors the formation of a solid and normal callus, resorption of œdema and hæmatoma, strengthening of the musculature, and recovery of the joint functions.

Heliotherapy benefits as a postoperative treatment in phlegmonous abscesses, mastitis, and osteomyelitis. Scars become soft and elastic.

The author refers to several favorable results observed in the treatment of war injuries by heliotherapy.

The technique followed is much the same as in the treatment of surgical tuberculosis, the exposure being gradual, commencing with the feet, the head and head being protected from the direct rays of the sun.

W. A. BRENNAN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Schoene, G.: Exchange of Normal Tissues Between Consanguineous Individuals (Austausch normaler Gewebe zwischen blutsverwandten Individuen). *Beitr. z. klin. Chir.*, 1916, xcix, 233.

Schoene gives the details, with illustrations, of an extensive series of animal experiments in the transplantation of tissues between consanguineous subjects; i.e., mother and sons, father and sons, brothers and sisters. The experiments were made in mice and rabbits and the tissue used principally was skin.

Schoene obtained positive results in so far as he observed growth, evident signs of full functioning, and full vitality of cutaneous strips engrafted 13 to 19 months before, with new production of skin. In rabbits durable results were not obtained.

These results and the possibility of their application in human clinical practice are discussed.

W. A. BRENNAN.

Loeb, L., and Hesselberg, C.: The Cyclic Changes in the Mammary Gland Under Normal and Pathological Conditions; the Changes in the Non-pregnant Guinea Pig. *J. Exp. Med.*, 1917, xxv, 285.

While, as the authors state, the literature dealing with the growth and function of the mammary gland is extensive, the mechanism determining the growth processes as well as secretion is incompletely known. Growth and function of the mammary gland are so closely interrelated with the cyclic changes of the uterus and ovaries that an under-

standing of the latter is a prerequisite for the former.

During the last ten years one of the authors has brought to a conclusion the analysis of the mechanism of the mammalian, uterine, and ovarian cycle in its principal outlines. On the basis of the previous studies it is now possible, they state, to attempt a further analysis of processes of growth and secretion in the mammary gland. While the results in this and the succeeding paper by the same authors clear up certain phases of the problem, it will be necessary, they state, in further studies to complete the analysis.

The conclusions embodied in this and their succeeding paper are based on the examination of the mammary glands in guinea pigs. In almost all the animals examined the period of heat had been observed and the period of the sexual cycle of the animal was therefore known. It was confirmed by microscopic examination of the ovaries and uterus in the majority of cases; the former were invariably cut in serial sections and thus a comparison between the condition of the ovaries and uterus on the one hand, and of the mammary gland on the other, was made possible. In addition, the majority of the animals were subjected to certain experimental procedures, under ether anaesthesia, at a known period of the sexual cycle, in order to determine the significance of the ovaries as a whole, of the corpora lutea, of the uterus, of the deciduomata, with and without pregnancy, and of lutein injection for the condition of the mammary gland.

The authors believe that a definite cycle exists in the mammary gland of the non-pregnant guinea pig which corresponds to the cycle in the ovary and uterus. This cycle can be presented through a curve in which the ordinates represent the degree of activity of the gland in a series of animals, and the abscissæ the time since ovulation — period of the sexual cycle. The curve passes through a first maximum at the time of heat and ovulation, they state, and gradually falls, the minimum being reached on the sixth day and continuing until the fifteen day after ovulation. Next begins the period when a new ovulation is imminent and the number of the proliferating glands again increases, so that during the normal cycle the presence of well-preserved, functioning corpora lutea does not lead to proliferation, neither do mature follicles have such an effect, the authors state. On the other hand, the absence or degeneration of the corpora lutea, they believe, is required to insure the proliferation of the mammary gland in the first period of the sexual cycle.

When the sexual period was experimentally prolonged, they found in some instances proliferation, while in others it was absent. As far as they could determine in the present study, two factors seem to favor proliferation of the mammary gland under these conditions: (1) the presence of well-preserved corpora lutea, particularly if they are associated with well-preserved experimentally produced deciduo-

mata, and (2) the imminence of a new period of heat. They do not believe, however, that the connection between good corpora lutea and good deciduomata and the presence of proliferating mammary glands at this state of the sexual cycle is absolute, as there were cases in which a proliferating gland was associated with some degeneration of the corpus luteum, or on the other hand, a well-preserved corpus luteum was associated with a non-proliferating gland. In some of the latter cases the simultaneous presence of a necrotic deciduoma, they state, may perhaps explain the lack of proliferation in the mammary gland. However, in the majority of cases they found the presence of good corpora lutea and good deciduomata associated with a proliferating mammary gland, but whether a living corpus luteum as such is able to produce proliferation of the gland, they consider as yet doubtful.

Extirpation of the ovaries they found to prevent not only the proliferation of the mammary gland associated with the first stage of the sexual cycle, the condition of heat and ovulation no longer taking place in castrated animals, but in all probability also to inhibit the proliferation of the mammary gland which occurs under certain conditions toward the end of the sexual cycle, or in instances of experimentally prolonged sexual cycle in which well preserved corpora lutea and deciduomata are present.

In animals in which the ovaries were hypotypical, the mammary glands were in an inactive condition. The presence of hypotypical ovaries had the same influence on the mammary gland as castration. In the majority, but not in all of their cases, well-preserved corpora lutea were absent.

Complete extirpation of the corpora lutea seemed to the authors directly or indirectly to prevent the secondary proliferation of the mammary gland, which occurs during the latter part of the sexual cycle or during an experimentally prolonged cycle, in cases in which the extirpation was not followed at once by a new ovulation. This conclusion they consider, however, merely as suggested, not yet as definitely established through their results. On the other hand, the primary proliferation of the mammary gland, during the first stage of the sexual cycle, as well as ovulation and the objective signs of heat, are accelerated, they state, through complete extirpation of the corpora lutea. Thus the effect of extirpation of the corpora lutea differs from the effect of castration, in that after the latter neither a new heat nor the primary proliferation of the mammary gland occurs. As one of the authors has previously pointed out, the absence of functioning corpora lutea and the presence of either well-developed ovarian follicles or of mature follicles are necessary for the occurrence of heat and ovulation. The same conditions they now consider prerequisites for the primary proliferation of the mammary gland.

In cases in which the whole or almost the whole uterus had been extirpated, the corpora lutea they found well preserved and the mammary gland proliferating.

GEORGE E. BEILBY.

Loeb, L., and Hesselberg, C.: The Cyclic Changes in the Mammary Gland Under Normal and Pathological Conditions; the Changes in the Pregnant Guinea Pig, the Effect of Lutein Injections, and the Correlation Between the Cycle of the Uterus and Ovaries and the Cycle of the Mammary Gland. *J. Exp. Med.*, 1917, xxv, 305.

In a previous paper the authors analyzed the cyclic changes in the mammary gland in the non-pregnant guinea pig. In this paper they report on their experimental studies of the mammary gland in guinea pigs during or following the period of pregnancy. They also report on the effect of injections of lutein on the mammary gland, and in conclusion discuss briefly the relation between the sexual cyclic changes in the ovaries and uterus on the one hand and in the mammary gland on the other.

In 26 guinea pigs the mammary gland was examined during different periods of pregnancy. They include in their series one case of experimentally produced extra-uterine pregnancy, of which a more detailed description has been previously given by Loeb from another point of view, which series also included a case in which pregnancy was present in one horn of the uterus, while in the other horn there was a beginning abortion, and a third case in which it was doubtful whether pregnancy or merely an experimental deciduoma was present. In the remaining 21 cases the animals had been used for certain experiments which, however, did not interfere with the progress of pregnancy, and the authors believe there is every reason to assume that they did not influence the condition of the mammary gland.

In five cases the mammary gland was examined within the first fifteen days after copulation. In one of these, however, the period of pregnancy they believe may perhaps have been slightly farther advanced. In these five cases the mammary gland was found in the following condition: in one animal 6 days and in another about 11 days after copulation, the mammary gland was intermediate; in three cases the pregnancy was approximately twelve to fifteen days old; in two of these cases the mammary gland was proliferating; in the third it was intermediate.

In their studies the authors found that in the pregnant guinea pig proliferation of the mammary gland became regular only at a later stage of pregnancy; namely, during the period following the twenty-fourth day of pregnancy. Previous to this period proliferation was absent in the majority of cases. Proliferation of the mammary gland during pregnancy became regular only at a period of time which exceeds the duration of the normal sexual cycle unaccompanied by pregnancy. They consider it probable that pregnancy as well as the presence of living deciduomata and corpora lutea increases the proliferative activity of the mammary gland as compared with the ordinary cycle in non-pregnant animals or in animals lacking corpora lutea and deciduomata.

After the completion of pregnancy and in the beginning of secretion some mitotic proliferation, they state, may still be present; but it soon ceases, probably as the result of those processes that lead to secretion. While during the period of secretion, notwithstanding the presence of a new pregnancy, mitotic proliferation soon ceased, some proliferative stimulus seemed still to be active, which, however, under existing conditions apparently led only to a mitotic multiplication of nuclei. The latter conclusion the authors only suggest at the present time and need to confirm through further studies.

In cases in which abortion took place in the first half of pregnancy secretion in the gland was not established; secretion occurred in two animals aborting toward the latter part of pregnancy. In one of these cases, mitotic proliferation of some gland cells was associated with the microscopic appearances of secretion.

In guinea pigs castrated during an early period of pregnancy, in which pregnancy continued for some time, proliferative changes were absent in the mammary gland. In conjunction with a partial similar effect observed after extirpation of the corpora lutea during pregnancy, the authors believe that the lack of proliferation in some of these cases may perhaps be attributable to the absence of the ovaries.

Extirpation of the corpora lutea during pregnancy induced a new ovulation and with it the primary proliferation in the mammary gland; abortion did not necessarily prevent these proliferative changes. Extirpation of the corpora lutea during pregnancy, the authors believe, may perhaps prevent the secondary proliferative changes in the mammary gland.

Five injections of cow's lutein given in relatively large quantities intraperitoneally did not produce proliferation of the mammary gland in the guinea pig.

GEORGE E. BEILBY.

Lincoln, W. A.: The Influence of Acidosis on Surgical Procedures. *Ann. Surg.*, Phila., 1917, lxx, 135.

Lincoln points out that the consideration of the condition known as acidosis is of great interest to every surgeon because the question of the proper reaction of the media in which the body cells function is a most vital one at all forms of life. He states that an alkaline medium is necessary for all life and that when the soil becomes acid it must be fertilized by adding alkali. Likewise in a living organism an alkaline medium is necessary to continue life, and as would be expected, a somewhat complex process has been built up to see that the necessary alkalinity is always maintained. There are two factors mainly to be considered in this process: (1) production of acids, and (2) their destruction or elimination.

The author discusses in some detail the manner in which these factors act to bring about the condition known as acidosis. He mentions the following diseased conditions in which an increased production of acid is found: (1) diabetes; (2) starvation

(ulcers, fevers, acute abdominal conditions, prolonged vomiting, diarrhoea); (3) periodic cyclic vomiting; (4) delayed chloroform poisoning; (5) pernicious vomiting of pregnancy; (6) salicylate poisoning, and he believes that there is a common underlying condition in all, namely, the inability to obtain or assimilate carbohydrates. He states that the condition is best treated by supplying sufficient carbohydrate and by the neutralization of those acid by-products present by the administration of alkali.

The author particularly emphasizes the possibility of acidosis occurring in many conditions beside diabetes and the necessity for surgeons keeping their eyes open to its dangers. The necessity of a proper and continued examination of the urine for acid by-products and the danger in the preparation of patients for operations of a too prolonged starvation, are specially emphasized by the author, particularly in the case of children or those suffering from any form of exhaustion. GEORGE E. BEILBY.

Davis, J. S.: A Comparison of the Permanence of Free Transplants of Bone and Cartilage. *Ann. Surg.*, Phila., 1917, lxxv, 170.

Inasmuch as there appeared to be some difference of opinion as to the relative stability of bone and cartilage transplants, the author carried out a number of experiments on dogs in order to clear up the matter, at least from an experimental standpoint. Ether anaesthesia was used in each experiment. In order to produce conditions which would be somewhat similar to those in actual clinical practice, he transplanted the cartilage and bone so that one extremity of the transplant was in close contact with a denuded portion of a membranous bone, while the remaining portion of the transplant extended into the soft parts.

His experiments were grouped as follows: (1) cartilaginous rib with perichondrium, and bony rib without periosteum; (2) cartilaginous rib with one-half perichondrium, and bony rib without periosteum; (3) cartilaginous rib without perichondrium, and bony rib without periosteum; (4) cartilaginous rib without perichondrium, and bony rib with one-half periosteum; (5) fibula with its periosteum, and fibula denuded of its periosteum.

From the author's wide experience and from this series of experiments which he carried out on animals, he seems to have proved conclusively that transplanted cartilage showed no signs of absorption, was normal in appearance, even when entirely denuded of perichondrium. Healing was reactionless, and the cartilage did not act as a foreign body. The measurements of the cartilage differed very little, if at all, from those taken at the time of transplantation. On section, the cartilage appeared normal and seemed well nourished. While he has often demonstrated that free bone, either with or without periosteum, when transplanted into soft parts, without any particular function, will eventually be absorbed, he concludes that these experiments

showed that transplants of free cartilage were unchanged during the length of time under observation, while free bone-transplants under exactly the same conditions either disappeared or showed marked degenerative processes.

GEORGE E. BEILBY.

Ely, L. W., and Cowan, J. F.: Experimental Tuberculosis of Muscle. *Am. J. Orth. Surg.*, 1917, xv, 134.

The authors performed a series of experiments on six rabbits to determine the effect of a pure culture of tubercle bacilli upon muscle tissue. The operations were done under ether narcosis. The skin of the thigh was shaved and washed with soap and water, then with alcohol, and finally with corrosive sublimate solution. The animals were killed at various intervals, and the material was decalcified with nitric acid, run up through the alcohols, imbedded in celloidin, and stained with hæmatoxylin and eosin, and with the Van Gieson stain.

The experiments proved that if a pure culture of bovine tubercle bacilli be buried in the muscle, the latter will become the seat of a tuberculous process, which otherwise has no tendency to spread into surrounding muscles, which will soon communicate with the surface, and become secondarily infected.

PHILIP LEWIN.

Kolmer, J. A.: Venom Hæmolysis After Splenectomy, Including the Resistance of the Erythrocytes of Normal Dogs to the Hæmolytic Activity of Cobra Venom. *J. Exp. Med.*, 1917, xxv, 195.

The resistance of erythrocytes of dogs to the hæmolytic activity of cobra venom is increased after splenectomy. This increased resistance was observed as early as four days after splenectomy and usually persisted for a period of about three weeks, when the resistance gradually decreased to normal or slightly beyond. This final decrease is apparently coincident with the anæmia following splenectomy. An intercurrent infection, such as distemper, tends to reduce the resistance of erythrocytes to venom. An increased resistance of erythrocytes to hypotonic salt solution was found with all splenectomized dogs in which these tests were made. As the lysis of erythrocytes by venom is dependent upon the presence of certain lipoidal substances within the cells, and as the spleen may exercise an influence over the lipoidal content of corpuscles and serum, Kolmer suggests that the increased resistance of erythrocytes to the hæmolytic activity of venom after splenectomy is due to alteration in the lipin content of the erythrocytes.

MAX KAHN.

RADIOLOGY

McCoy, J. N.: A Preliminary Report of Forty-five Consecutive Cases of Malignant Growths Treated with X-Rays. *Am. J. Surg.*, 1917, xxxi, 22.

The author believes that the cure of superficial malignancy by X-rays is a certainty and opposes

surgical interference. He advocates combined surgical and roentgen treatment for deep-seated malignancy and makes a plea for teamwork between the two in behalf of humanity. Cancer is appearing in younger people than in former years. The 45 cases ranged in age from 29 to 82. The greatest frequency was at the age of 60.

The presumption that smoking is a cause of cancer is discredited. Only 11 out of 27 cancers of lip and mouth occurred in smokers. It is urged that warts, moles, etc., be promptly removed as a prophylaxis. He attempts the cure of superficial cases by means of the intensive soft ray dose, repeating if necessary after the reaction has disappeared. There is no evil result from a second-degree reaction. All patients are required to report monthly for observation for one year after apparent cure. He thinks any time limit set for recurrence would be arbitrary, but all recurrences he has seen either from X-ray treatment or surgery have been within eighteen months.

Of 16 deep-seated cases of cancer or sarcoma treated, 9 were successfully treated, 1 died of another disease during treatment, and 6 ended fatally. Four of the fatal cases had bone involvement. Of the series, 28 cases were superficial; 27 were cured; and 1 discontinued treatment.

Comas, C., and Prio, A.: A New Case of Roentgen Carcinoma in a Specialist (Un nuevo caso de carcinoma rontgen en un especialista). *Rev. méd. de Sevilla*, 1916, xxxv, 341.

The authors report a case of carcinoma in a professional roentgenologist of Seville, who had been so occupied since 1898. In 1912, lesions appeared which were exclusively localized to the backs of both hands. Some of these disappeared, leaving only slight impressions. On the ring finger of the left hand one of the lesions developed into an ulcer which was rebellious to all treatment. Ultimately metacarpophalangeal disarticulation of the finger was necessitated. Many lesions still persist on the right hand. The history of the patient does not offer any explanation for the appearance of the lesions which can only be attributed to the action of the X-rays. Histopathological examination has established undoubtedly that there was an epitheliomatous degeneration consecutive to the process of chronic roentgen dermatitis.

W. A. BRENNAN.

Boggs, R. H.: Differential Roentgen Diagnoses in Bone Diseases. *N. Y. M. J.*, 1917, cv, 112.

It is generally recognized that roentgen rays have certain limitations, both in the diagnosis and in determining the exact extent of the disease. The diagnosis of disease of the bone is made by variations of density and architecture, together with certain lesions having a predilection for certain sites, while in certain other diseases the roentgenograph is so characteristic that, when considered with the clinical history, the diagnosis may be made without difficulty. Several diseases may show the same

changes in density but the pathological changes produce an entirely different architecture. In other diseases the picture is very similar, and the only value of the roentgen rays is to disclose bony destruction. In such cases the diagnosis must be made by other means. In other diseases the roentgenograph may be so characteristic as to be diagnostic, giving accurate knowledge of the extent of the disease.

Tuberculosis of bones and joints, more common in young than in old people, is the usual disease affecting these parts. In the early stage it is to be noted that if the disease starts in the synovial membrane, no bony changes are seen, though it may be suggestive, not diagnostic. When the disease starts in the bone, roentgen evidence is visible sooner. In tuberculosis the roentgenograph shows bone atrophy or rarefaction, bone destruction, sequestra, and abscess formation. In children the vertebræ, hip-joint, and knee are the most common sites for tuberculosis, in the order mentioned.

In the differential diagnosis of bone tuberculosis by the roentgen rays the following points are noted: In syphilis the bone is porous instead of translucent, and the periosteum and cortex are denser and wavy in outline. In rickets there is a flaring out and irregular cup-shaped defect of the diaphysis, and in scurvy the epiphyses are flattened, which is characteristic of the disease. The diagnosis between osteomyelitis and tuberculosis by the roentgen rays is often difficult, but we must take into consideration the fact that osteomyelitis does not produce bone atrophy and there is a periosteal overgrowth which is not present in tuberculosis, except when the disease involves the shaft. In bone-cyst there is a clear space, but bone atrophy is lacking.

Osteomyelitis, in the early stage, usually cannot be detected by the roentgen rays. The earliest change is a slight increase in periosteal shadows at one or more places, and a definite swelling of the soft parts. Six to eight weeks later there will be alternating light and dark areas with rarefaction, showing a softening and loss of lime-salts seen at one or both epiphyseal ends of the bone extending to a greater or less length of the shaft, ending abruptly at the epiphyseal cartilage associated with new bone formation.

Sarcoma is the most common tumor of the bone, and in the early stage cannot be diagnosed roentgenographically from a simple inflammatory process. Endosteal sarcoma has its origin in the medullary cavity or cancellous portion. This causes absorption of the bone from within, followed by expansion and at the same time osseous deposits on the under surface of the periosteum. Fine trabeculae may pass through its substances from wall to wall of the capsule, giving a honeycombed appearance. The shaft of the bone above and below a sarcomatous growth is normal and suddenly expands at the tumor. The growth generally begins at the end of one of the long bones, but rarely involves the joint.

Periosteal sarcoma is the most difficult type to

diagnose by the roentgen rays, but as soon as the periosteum shows thickening dense enough to cast a shadow, it can be shown on the plate.

The roentgenographs of syphilis of the bone are usually characteristic. The chief manifestations of syphilis of the bones are epiphysitis, periostitis, and gumma. There is an irregular epiphyseal line with periosteal new bone formation of the shaft side of the epiphyseal line. In syphilitic epiphysitis we sometimes have a separation of the epiphysis, but it is to be remembered that thickening of the shaft on the epiphyseal side is diagnostic of syphilis. Probably the most common manifestation of syphilis of the bone is periostitis, which presents a typical roentgen picture. There is a lamellation of the periosteum running parallel to the cortical line of the bone. When periosteal bone occurs there may be new endosteal bone formation producing a partial obliteration of the medullary cavity. Gumma may appear either in the form of a circumscribed periostitis causing round nodes and sometimes softening and breaking down, or may begin in the marrow or in the spongy parts of the bone. The mouse-eaten or mosslike appearance of the periosteum is very characteristic. The gummatous infection of bones, if localized, shows erosion and rarefaction of a limited area of the shaft of the bone with new periosteal bone formation on either side of the affected area.

Carcinoma of bone is secondary to a growth elsewhere in the body, such as the breast, prostate, etc., and usually follows the scirrhus type. It is a late manifestation and affects the sternum, ribs, spine, and long bones most frequently, but may attack any bone. The changes are shown on the radiograph as irregular shadows of varying density, lighter than the normal bone. In some cases the disease takes the form of necrosis, when the cavities are filled with necrotic tissue and appear as lighter areas on the plate.

MILITARY SURGERY

Fiessinger, N.: Local Leucolysis in Gangrenous Infection of War Wounds (La leucolyse locale dans l'infection gangréneuse des plaies de guerre). *Paris chir.*, 1916, viii, 461.

In war wounds proteolysis, that is to say the chemical digestion of the albuminoid molecule, is the method of elimination of necrotic tissues. In the origin of this proteolysis the ferments of the neutrophile leucocytes are especially found. This reactionary proteolysis is produced at the surface of the wound. Beneath it there is a congested zone which exerts an antitryptic action and limits the area of the proteolysis.

In gangrenous wounds, especially muscular wounds with invading gaseous gangrene, the progress of the biologic process is quite different. Here there is also proteolysis, but its cause is different and it is due to pathogenic elements. It is no longer leucocytic but microbic. This is the

essential point of difference and in the author's view it is to this proteolysis that the extensive and ravaging progress of gangrene is due. He demonstrates this by studying the fate of the polynuclear leucocytes in gangrenous tissues in the exudate and under the contact of the fluid of oedematous gangrene. These studies lead the author to conclude that, as well as the hæmolysis due to anaerobic microbes in gangrenous infections of war wounds, there also is a leucolysis which is less rapid and less destructive than the hæmolysis. The leucolysis begins by multiple degenerations, and leads rapidly to the death of the leucocyte. It is not attributable directly to microbes or their toxins, but it results rather from the action of the products of putrefaction of albuminoids.

The presence and action of this leucolysis justifies especially wide and large opening up of the wound which alone favors the elimination of toxic substances.

W. A. BRENNAN.

Vincent, H.: War Wounds and the Prophylaxis of Surgical Infections (Les plaies de guerre et la prophylaxie des infections chirurgicales. *Bull. Acad. de méd.*, Par., 1917, lxxvii, 136).

Vincent considers that in general the bandages applied at first aid stations in war do not protect against germs which find in them no obstacle to rapid multiplication. He considers nevertheless that it is on the efficacy of this first bandaging that the surgical prognosis of the wound depends particularly, and quotes a dictum of Dastre: "The greatest progress which military surgery can make will be the early bandaging of wounds. An organization which would realize this would render incalculable service." It is highly necessary to formulate rules for the surgical prophylaxis of war wounds. The antimicrobial struggle is so much the better armed if disinfection is early. This must be done at the first aid posts without loss of time by a preventive disinfection of the wound.

The author has been engaged in the study of such preventive disinfection of wounds since the Madagascar campaign of 1894-6. He has tested the efficacy of a large number of substances, and of all of these hypochlorite of lime in weak dosage has shown itself to be the most efficacious. A series of experiments has been made by the author to determine what agents associated with the hypochlorite would give a mixture applicable to human wounds, and boric acid has been found the best. The formula of the author's antiseptic mixture is:

Hypochlorite of lime (titrated, 100 to 110 liters of chlorine), 10 gr. Official boric acid, very dry 90 gr. (To be separately pulverized, mixed with care and preserved in dry flasks.)

All wounds except penetrating chest and abdominal wounds are treated with this dressing at the first aid station. It is in no wise prejudicial to living tissue nor does it cause any alteration in them and it is perfectly tolerated. It does not obviate surgical intervention, but it helps it by the immobil-

ization of infection from the time of placing the bandage to the moment of operation. It keeps the patient in the condition he was in when first injured.

The author quotes a number of cases to illustrate the efficacy of this disinfectant in the case of large serious wounds. He also gives the technique. He claims that the antiseptic powder is at once a preventive, antiseptic, and hæmostatic, and the simplicity of its use renders it of vast aid at the advanced posts in war, where, according to the author, the patient's future depends on the first dressing.

QUÉNU and DELORME in discussing the paper expressed the opinion that further experience should be awaited before pronouncing any definite decision. They doubted the efficacy of a powder disinfectant in reaching the intricacies of a deep wound.

W. A. BRENNAN.

Morton, C. A.: The Treatment of Secondary Hæmorrhage, with Special Reference to Gunshot Wounds. *Lancet*, Lond., 1917, cxcii, 213.

Secondary hæmorrhage while rare in civil practice, occurs quite often after gunshot wounds, usually from an injured artery in a suppurating wound. It may start quite insignificantly, hence nurses should report any bleeding from a wound. The only safe method of treatment is to cut down on the vessel and ligate it both on the proximal and distal sides unless the artery is surrounded by sloughing tissue, then one is compelled to ligate higher up. Every effort is now made to lessen the sepsis in the wound. Every ward should be provided with a tourniquet and a nurse or orderly instructed in applying it. In the neck, groin, and gluteal region digital pressure alone will control the bleeding until operation can be performed.

D. N. EISENDRATH.

Allers: Transport of Wounded with Head Injuries. *Wien. klin. Wchnschr.*, 1916, Sept. 7.

Allers has studied the important question whether it is best to immediately operate upon cranial wounds at the advanced formations or to send them unoperated to the base hospitals. Sixty-six of these cases were operated upon at the front and then sent to the base. The results are shown in the following table:

Transported 1-5 days after operation, 12; died 6; 100 per cent.
Transported 6-10 days after operation, 7; died 6; 50.8 per cent.
Transported 11-15 days after operation, 18; died, 3; 16.6 per cent
Transported 16-20 days after operation, 11; died, 1; 0.9 per cent.
Transported 21-25 days after operation, 9; died 0; 0 per cent.
Transported 26-30 days after operation, 6; died, 0; 0 per cent
Transported 31-40 days after operation, 4; died, 0; 0 per cent.

This shows that transportation within the first five days after operation means certain death; while the percentage of deaths falls gradually to

nothing if transportation is delayed for four to five weeks.

Experience has shown that operation in cranial wounds deferred even up to three or four days after injury still gives good results. Allers finds that operations executed within the first week give a mortality of 12 per cent. It therefore seems best not to operate at the front; but if this is done then an interval of at least ten to twelve days should elapse before the man is sent to the rear.

Allers thinks that the reason why the unoperated stand transportation better than the operated is to be found in the behavior of recent wounds. In such there is a very rapid formation of adhesions of the dura in the periphery of the injury. There is a concomitant increase of cerebral tissue as well as an increase of pressure, all of which tend to prevent diffusion of infection. But if fragments of bone, etc., are removed secretory flow and tension are diminished, and there is little obstacle to the spread of infection. Autopsy findings confirm this point of view.

W. A. BRENNAN.

INDUSTRIAL SURGERY

Howe, G. L.: Industrial Versus Private Medical Practice. *N. Y. St. J. Med.*, 1917, xvii, 84.

After a study of the subject the following conclusions were reached by the author:

1. Industrial medical practice is a form of public health work, and as such its principal aim should be the practice of preventive medicine.

2. Sick and injured industrial employes are more apt to consult the company physician without delay in cases of minor illness and accident than if such services were not provided. This aids materially in the prevention of wound infection and in the early detection of disease.

3. The relationship between the industrial worker and the company physician is an unusually straightforward one, and is entirely free from the element of money. As a result of this, conditions are ideal for giving the employe the best possible service.

4. The industrial physician is in a position to prescribe drugs only when actually needed.

5. Patients in industrial practice may be seen as often as necessary or desirable without opposition on their part.

6. The number and variety of cases seen in industrial practice is great, thus providing wide experience for the physician engaged in this work.

7. The industrial physician usually has the use of unlimited equipment, and in this respect has the advantage over the average man in private medical practice.

8. Industrial medical practice provides a stimulus for high grade work, for the reason that it requires ability, good judgment, and a pleasing personality to please thousands of employes.

9. Industrial medicine is a definitely established fact, and its field is being rapidly extended.

J. H. SKILES.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Hunt, E. L., and Mills, O. M.: *Some Experience Bearing on the Medicolegal Value of the Precipitin Test for Human Blood.* *Boston, M. & S. J.*, 1917, clxxvi, 48.

Having failed in the attempt to identify by the precipitin test a specimen of blood from a medico-legal case, beyond the general statement that it was of mammalian origin, the authors studied the method further.

The sera were prepared by immunizing rabbits with intravenous injections of fresh human blood, injecting 2 or 3 ccm. every five days, for three doses. One effort was made to apply the rapid method of Fornet and Mueller, giving intraperitoneally three doses of defibrinated blood of 5, 10, and 15 ccm. respectively, on consecutive days. The reaction of immunity attained its high point on the fourteenth day after the last dose, remaining there for about five days, then receding. Blood was obtained in quantity by cardiac aspiration, test portions being obtained by aspirating the ear vein. Death of a rabbit from anaphylactic shock was not uncommon, the third dose being usually the first to be dreaded. Fourteen rabbits were immunized, of which seven gave workable serum (i.e., a titer of 1:1000 to 1:2000), three gave sera of fairly high value (1:5000 to 1:10,000). None gave serum of the high value

recommended by Uhlenhuth (1:20,000), who stated that not infrequently only one rabbit in ten produced a high titer serum.

In carrying out the test, Uhlenhuth's technique was followed, and the controls were: (1) the test solution against normal rabbit serum, (2) fresh human serum against the antiserum, (3) serum of some lower animal 1:200 against the antiserum, (4) of some other animal ditto, (5) 0.85 saline, (6) an extract of the fabric from which the stain was taken. From the results attained, the following conclusions were drawn:

1. The precipitin test, when it reacts, is a valuable and positive method of identifying blood stains. A negative test does not of itself disprove the presence of the homologous blood.

2. A serviceable serum may take weeks to prepare, consequently a supply of adequate sera should be kept on hand, in order that blood stains need not be subjected to prolonged drying before testing.

3. In a murder case it would be of advantage to have blood from the victim in sufficient quantity to carry out immunization, thus being better prepared to obtain a serum of high specific value.

4. There may be individual variation in the power of blood to respond to the precipitin test; consequently failure to identify should not be considered final until other and stronger sera and the complement fixation test of Neisser and Sachs have been tried.

E. K. ARMSTRONG.

GYNECOLOGY

UTERUS

Mayo, W. J.: *Myomata of the Uterus, with Special Reference to Myomectomy.* *J. Am. M. Ass.*, 1917, lxxviii, 887.

The author does not accept the opinion so frequently expressed that every myomatous uterus should be considered surgical. He believes, rather, that only those myomata which are giving rise to symptoms require operation, although all women who have myomata should be examined at intervals to see that the tumors are causing no harm.

The most common conditions indicating operation are those which result from: (1) hæmorrhage; (2) degeneration of the tumor, 22 per cent; (3) malignant disease, usually carcinoma of the body of the uterus, 4 per cent (Ten per cent of women more than 50 years of age who come to operation for uterine myoma have complicating malignancy.); (4) tumors causing pressure. The large majority of patients with tumors which can be felt suprapubically belong to this group and, with or without symptoms, should be operated upon. In 30 per cent of patients with myomatous uteri causing symptoms, the ovaries and tubes are so seriously diseased as to require operation independently of the myomata.

One cannot escape from the conviction that in myomatous disease, the use of radio-active substances is destructive — non-operative, but not conservative. In the great majority, if not all, of the cases in which the myomata completely disappear under their use, the patient loses the function of the ovaries, tubes, and uterus, although the non-functionating remnants are left *in situ*.

Uterine myomata are rather frequently associated with goiter. The estimation of the operative risk depends on the condition of the thyroid — goiter heart. Heart-lesions of any description lead to a fear of operation. The common type of lesions is mitral, beginning in the young, as an endocarditis in connection with chorea, or "inflammatory rheumatism," and without hypertension. If well compensated, this type of lesion apparently does not increase the surgical risk. Women with bleeding submucous myomata occasionally develop heart lesions of the same character with marked secondary anæmia, probably due to a similar infection, and the condition is an indication for, rather than against, operation.

Hysterectomy has been and still is the operation of choice for all symptom-producing myomata, and it has much to commend it. In patients more than 40 years of age, and especially those with degeneration of the tumor, this operation is indicat-

ed. Supravaginal hysterectomy has a definite technique which has been so thoroughly and carefully worked out in the past twenty years that it has become the standard operation. Preserving the cervix renders the operation easier and safer, but the cervical remnant has no function and two unfortunate propensities: (1) it leaves the patient with a liability to cancer — an average liability, and (2) it is the cause of the large majority of those sometimes troublesome vaginal discharges which go by the name of leucorrhœa, due to subsequent disease of the mucous glands of the cervix. For this reason, in all cases of erosion, cystic degeneration or other disease of the cervix, it is best to remove the cervix with the body of the uterus, provided it can be done without unduly increasing the risk of the operation.

Myomectomy for myomata of the uterus has not been a popular operation. From January 1, 1891, to September 1, 1916, 504 consecutive myomectomies were done at the Mayo Clinic with four deaths in the hospital, a mortality of 0.8 per cent. Only five patients required hysterectomy later for any cause. It must be taken into consideration, however, that the patients subjected to myomectomy were, in a way, selected cases. Myomectomy was not often done in those over 40, and it was not frequently done after the age of 35 unless the conditions were such as to make it safe. On the contrary, it was done for the majority of patients with myomata, who were under 35 years of age and for practically all under 30 years. As the tumors which require operation are much more frequent after the fortieth year, it can readily be seen that one should be conservative in choosing cases for myomectomy.

Fourteen patients were pregnant at the time the myomectomy was performed, and the majority went to term and were delivered of living children. When it is considered that in the latter group the tumors were degenerating with acute symptoms, and that in a large proportion indications of spontaneous emptying of the uterus were present at the time of the operation, it is remarkable that the disturbance so frequently quieted down without premature expulsion of the child. In not a single instance was it necessary to do hysterectomy on the pregnant myomatous uterus with a non-viable child.

Of the 504 myomectomized patients, 24 have had living children since the operation, and 7 have had two or more. Thirty-eight living children to date following myomectomy is a strong argument for the conservative operation. Five others are normally pregnant now.

EDWARD L. CORNELL.

Alfieri, E.: Myomectomy in Pregnancy (Miomec-tomia in gravidanza). *Ann. di ostet. e ginec.*, 1916, xxxviii, 369.

The author reports a case of myomectomy in a woman of 35, a primipara, who was six months pregnant. The pregnancy went regularly to term and a living child was delivered. The fibromyoma which was removed weighed 1,025 grams, and was the size of a child's head. It was attached by a pedicle to the fundal part of the uterus with numerous omental adhesences attached to its upper surface.

In 1890 Pestalozza found 18 cases of laparomyo-mectomy during pregnancy with an operative mortality of 27 per cent. In 1907 Thumim in 102 collected cases found that the maternal mortality fell to 7.8 per cent. In 1910 Troell showed a mortality of 3.9 per cent in 157 collected cases; and finally Landau in 1914 reported 14 cases operated upon without a death. Considering all available statistics the author shows that during the past twenty years the maternal mortality from myomectomy performed during pregnancy does not exceed 8 per cent.

Interruption of pregnancy was found by Pestalozza to occur in about 30 per cent of the cases. In the very latest statistics it is 7 per cent. Alfieri thinks that on the whole it may be taken to be about 20 per cent. Similarly statistics show that foetal mortality may be calculated at about 25 per cent.

In contrast with these figures the author displays the various statistical reports of uterine fibromata complicating pregnancy in which there was no surgical intervention. He finds that the maternal mortality was 3 per cent, foetal mortality, 20 per cent, and 15 per cent of interrupted pregnancies in cases strictly watched under modern methods or in which intervention was strictly limited to those cases in which the maternal life was threatened.

Regarding the procedure of myomectomy as compared with other radical mutilative methods it has the advantages not only of respecting the life of the foetus but also it cures the mother of an afflicting morbid condition and conserves the possibility of ulterior conceptions. It must therefore remain the operation of choice in cases where an intervention is necessary. On this latter point there is almost universal agreement today among leading gynecologists that such intervention is only legitimate when grave accidents occur which are capable of compromising the maternal life, and that it should be limited to myomectomy when this is technically possible and without too much danger.

W. A. BRENNAN.

Boldt, H. J.: Zinc Chloride in Uterine Hæmorrhage Particularly When Caused by Uterine Myomata and Metro-Endometritis or Fibrosis Uteri. *J. Am. M. Ass.*, 1917, lxviii, 832.

The zinc chloride solution is applied on gauze by means of an intra-uterine applicator syringe. Care should be taken not to allow the zinc solution to come in contact with the cervix.

It has been found that one application of zinc chloride, if properly made, once in four weeks usually suffices. This is to be repeated at intervals until the wished-for result has been brought about. From four to twelve applications generally suffice. With twelve applications, or even a lesser number, it has been found possible to effect complete amenorrhœa in very profuse bleeding from interstitial myomata. Some of these tumors, in the author's experience, were fully 6 inches in diameter.

Zinc chloride is made use of when uterine bleeding is very profuse from a chronic inflammatory condition of the endometrium, whether the myometrium is involved or not. If the bleeding is not too profuse or too prolonged, phenol suffices to bring about relief. Zinc chloride is always used for profuse bleeding when caused by interstitial myomata of small size. In large tumors of this character, it is not advisable to use it because it is more to the interest of the patient, if radium or roentgenotherapy are not to be used, to remove the tumor.

One should always be sure, before using such treatment, that the bleeding is not caused by a malignant change of the endometrium.

EDWARD L. CORNELL.

MISCELLANEOUS

Ucros, R.: Statistics of Gynecological Surgery (Estadística de cirugía ginecológica). *Rep. de med. y cirug.*, Bogota, 1916, viii, 7.

The author presents the details of 147 gynecological operations carried out during the years 1914-1915 in the Gynecological Service of the Hospital de San Juan de Dios Bogota. A large number of these were major operations such as Wertheim's abdominal hysterectomy. The mortality for the 147 operations was 5.4 per cent. In the year 1910 in 196 similar operations the mortality was 13.7 per cent and in 135 operations in the years 1912-1913 the global mortality was about 15 per cent.

The much more brilliant results of the last few years is attributed to the installation of a special gynecological department, the introduction of rubber gloves, and strict rigorous asepsis.

W. A. BRENNAN.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Kosmak, G. W.: *The Conservative Treatment of Eclampsia.* *Bull. Lying-In Hosp.*, N. Y., 1917, xi, 33.

The author frankly states that he is a conservative as regards the treatment of eclampsia in general, but may become a radical on special occasions. He, furthermore, states that individualization must be the watchword in the treatment of these serious toxic states during the latter months of pregnancy. What will fit one case in the way of treatment certainly will fail in another.

In every instance the mother should have first consideration because, at best, the child is a weakling, usually premature, and if at full term, so toxic that its existence is measured by hours. Therefore, quick delivery, in the opinion of the author, should not be done at the sacrifice of the mother's soft parts or perhaps, indeed, her life.

In primiparæ before term, five to eight months, it is the author's habit to institute the usual eliminative treatment plus enough morphine to quiet restlessness and wait for labor to terminate spontaneously. Rarely there may be occasion in such cases to induce labor, in which instance the author prefers Voorhees' bags. In robust cases where the systolic blood-pressure is 175 or over with cyanosis and dyspnoea, 8 to 12 ounces of blood by phlebotomy are allowed to escape.

In primiparæ near or at term, labor is induced by the employment of Voorhees' bags and allowed to terminate spontaneously, or if not readily accomplished, forceps are applied and the child immediately delivered. Under such conditions a live child may be expected. There are, however, cases where a more rapid delivery is absolutely necessary, e.g., a primiparæ at term, large baby, head at or above the brim, long rigid cervix, and early cæsarean section, abdominal or vaginal, should be the method of choice for delivery. The eliminative treatment must also be carried out after the delivery.

Kosmak concludes that in view of the fact that eclampsia seems to terminate in labor, we should be more conservative in our attitude toward this disease. It is always due to neglect, either on the part of the patient herself or the attending physician. If proper precautions are taken eclampsia should be very greatly diminished. HARVEY B. MATTHEWS.

Chamorro, T. A.: *Extraperitoneal Cæsarean Section* (Césarea extraperitoneal). *Semana méd.*, 1917, xxiv, 149.

The author gives full clinical details, with illustrations, of five Ritgen-Latzko-Doederlein extra-

peritoneal cæsarean sections successfully performed, with a living child in all cases. He discusses the history, technique, indications, etc., of this method.

Von Jorg of Leipzig in 1806 was the first to suggest the idea of incising the neck and vagina instead of the body of the uterus as in the classical cæsarean. Ritgen, Baudelocque, and several others tried it but with such generally poor results that it fell into disuse. Frank of Cologne revived it in 1905 under the name of suprasymphysary cæsarean section. Sellheim in 1908 published 2 cases operated upon by the extraperitoneal method, and many other cases followed with various results. The final refinements in technique introduced by Latzko and Doederlein have removed most of the difficulties from the procedure.

The technique is fully described. Extraperitoneal cæsarean section is in general indicated in the interests of the mother in women who, during labor, show fever, infection of cavity, prolonged labor, where birth seems impossible by the natural route, and where the patients have undergone manipulations or interventions; that is to say in cases where there is absolute necessity for the high route of extraction, but in which the classical cæsarean is strongly contra-indicated. The author's personal opinion is that precise indication is given in cases of contracted pelvis, with the bag of waters prematurely ruptured and with a living child. A dead foetus is a contra-indication, also insufficient development of the lower segment, abnormal peritoneal adhesions, cancer of the uterine neck or tumors of the lower segment.

The general conclusions reached by the author from his study and experience are:

1. Extraperitoneal cæsarean section is a well indicated operation, the procedure and its application being based on anatomical and clinical grounds.
2. Its execution and technique require surgical skill.
3. A combination of the methods of Latzko and Doederlein is the ideal procedure.
4. Infection of the genital passages or of the uterine cavity is not a contra-indication.
5. On termination of intervention, good drainage and constant care are essential.
6. The cicatrices of the wall and of the uterus support subsequent pregnancy and labor well.
7. A contraction dystocia which does not involve the foetus does not appear to be a contra-indication.
8. The uterus being opened in the lower segment, foetal extraction is preferably made by expression of the uterus, the use of forceps entailing danger.
9. Extraperitoneal cæsarean section is performed in those cases of accentuated pelvic contraction with

a uterine cavity either infected or suspected to be infected and with a living child; always provided that no other conservative intervention of a less sanguinary kind is indicated. W. A. BRENNAN.

Funck-Bretano, L.: Four Cases of Repeated Cæsarean Sections on the Same Patient (A propos de 4 cas d'opération césarienne itérative). *Ann. de gynec. et d'obst.*, 1916, xlii, 368.

In 17 cæsarean operations performed by the author 4 were on patients who had already been submitted to this operation. In one of these cases the operation had been repeated four times on the same patient with satisfactory results for mother and child. W. A. BRENNAN.

Harrar, J. A.: A Source of Danger in the Elective Cæsarean Section Before Labor and with Undilated Cervix. *Bull. Lying-In Hosp., N. Y.*, 1917, xi, 46.

There may be, according to Harrar, several sources of danger in performing an elective cæsarean before labor and with an undilated cervix. They may be tabulated as follows:

1. The act of inserting the hand through the uterine incision before the child is delivered and sweeping the hand around between the membranes and the uterine wall, the object being to free the attachments to the uterine mucosa and prevent retention of pieces of membrane.
2. It is not only difficult, but dangerous, to free the membranes from around the cervical os from above because of the possibility of wiping infection up from the vagina into the field of operation.
3. In certain cases where the cervix has not been effaced, the chorion often remains covering the cervical os, thus blocking the cervical canal. Such a uterus distended with blood keeps on bleeding until the patient goes into shock.
4. Separation of the membranes with the finger in the cervical os before operation has been suggested but should be condemned because of the possibility of introducing infection.

In Groups 3 and 4 puncturing the membranes from the vaginal side after the operation is completed is by far the safest procedure where these conditions are present. HARVEY B. MATTHEWS.

Newell, F. S.: The Present Status of Abdominal Cæsarean Section. *J. Am. M. Ass.*, 1917, lxviii, 604.

Although during its period of development the indications for which cæsarean section was performed were practically limited to disproportion between the foetal head and the maternal pelvis, the excellent results which followed its employment in properly selected cases have led to a marked broadening of the indications. The time has now been reached when some operators seem to resort to it for slighter indications than those for which they would perform a low forceps operation, exercising little or no care in the selection of proper

cases, with the result that, although the published statistics still show it to be a safe surgical procedure under proper conditions, the unpublished results are appallingly bad.

In four cities of from 25,000 to 40,000 inhabitants within 40 miles of Boston, the following data were collected:

In the first city, no patient on whom cæsarean section was performed is known to have recovered.

In the second, the mortality was from 60 to 75 per cent.

In the third, cæsarean section is believed to be a universally fatal operation when performed by the local surgeons.

In the fourth city cæsarean section is an operation of from 10 to 20 per cent mortality in average cases; but since it has been adopted as the routine method of delivery in eclampsia, the mortality has greatly increased, being over 50 per cent in these cases.

In well-equipped private hospitals in Boston, seven patients are known to have been lost recently after operation by supposedly well trained surgeons.

The majority of operators apparently choose cæsarean section as a panacea for all obstetric difficulties when some other method of delivery should have been selected, and then blame the patient or some one else for the bad result, forgetting that the responsibility is theirs and that there are certain well known factors which render the operation safe or extremely dangerous, according as they are strictly adhered to or neglected. The primary cause of most bad results is either a failure to recognize the contra-indications to the operation or an improper surgical technique, and the responsibility rests with the surgeon.

The most essential factor for success in cæsarean section is that cases for operation should be selected with the greatest care and that operation should be refused to all patients in whom uterine infection can be demonstrated or is even seriously suspected, provided delivery can be accomplished by some other means.

Patients suffering from acute infections of any sort, whether local or general, should be classed as poor risks for abdominal delivery, and operation should be refused if any other method of delivery is possible. Chronic diseases complicating pregnancy, such as chronic nephritis, diabetes, and heart lesions, render the prognosis of cæsarean section more serious than if the operation is performed on a healthy patient.

Pre-eclamptic toxæmia and eclampsia are, at the present time, cited as indications for abdominal delivery. The best results published to date, however, show a distinctly higher mortality than when delivery is effected by other means and, although in individual cases the operation may be advisable, it is so in spite of and not because of the complicating toxæmia.

If the contra-indications are scrupulously regarded abdominal delivery is as safe as a major surgical operation can be, subject only to the ordinary sur-

gical risks, as embolus, ether pneumonia, etc., and should be attended by a mortality of less than 1 per cent. The principal factors which render it safe, however, are the determination of its necessity by careful study of the patient during pregnancy, and the proper preparation of the patient for operation, so that the operation may be performed at a set date, preferably before labor begins, or very early in labor, under proper conditions. Emergency surgery is always relatively unsatisfactory in its results and caesarean section offers no exception to this rule.

EDWARD L. CORNELL.

Winter, G.: Restriction of Provoked Abortion (Die Einschränkung des künstlichen Aborts). *Zentralbl. f. Gynaek.*, 1917, xli, 1.

Winter discusses the political aspects of curtailment of population. Before the present war the decline in births was a serious matter, but this takes on a new aspect in connection with the immense losses in the male population. Winter thinks that artificial therapeutic abortion, quite apart from criminal abortion, must be as far as possible discontinued. Bumm, in the large material available in the University Clinic at Berlin, has only had occasion to practice therapeutic abortion about 12 times per year. In the author's clinic during the past 6 years, in a total of 5,500 cases, he has had to perform abortion only 31 times. Bumm also mentions that of 202 cases sent to the clinic for therapeutic abortion he only performed it in 59 cases. In the years 1910 to 1915, 134 women came to the author's clinic for therapeutic abortion as follows: (1) of their own accord, 55; (2) sent by physicians, 72; (3) sent from the intern clinic, 4; (4) sent from the obstetric dept, 3. Of these only 30 had to be operated upon.

It may be inferred from this that at least two-thirds of the therapeutic abortions performed by private physicians are not indicated and are unnecessary when the cases are dealt with by skilled obstetricians. This is the evil practice that must be suppressed. On no account should therapeutic abortion be included among legitimate obstetrical operations.

There is scarcely any agreement among competent physicians as to the causes which are strictly indicative of induced abortion. In every case where an abortion is considered a consultation should be held with a special internist who would not be concerned with the pregnancy but with the absolute condition of the woman as to concomitant disease. The author recognizes that 80 per cent of abortions have their initiative from the woman herself and discusses this phase of the question from the political and professional viewpoints.

W. A. BRENNAN.

De Bellard, E. P.: A Case of Complete Central Placenta Prævia (Sobre un caso de placenta prævia central completa). *Gac. méd. de Caracas*, 1916, xliii, 180.

De Bellard's case of central placenta prævia occurred in a woman of 22, a II-para. She had had

several hæmorrhages during the later months of her pregnancy. In the early part of the ninth month, examination by the author revealed distinctly the existence of a spongy mass between the presenting foetal part and the examining finger, which led to the diagnosis of complete placenta prævia. As the woman was in good condition no intervention was made. When about to full term she was suddenly seized with a very severe hæmorrhage and labor was induced. The foetus was easily delivered by version by the Braxton-Hicks method, but was asphyxiated and could not be revived.

The placenta weighed 564 grams. The cord was inserted about 4 cm. from the placental edge. The perforation was situated about 7 cm. from the placental edge in a direction opposite to that of the insertion of the umbilical cord. There was complete laceration at the site of the perforation extending from it to the placental margin.

W. A. BRENNAN.

Chambrelent: Rapid Hydramnios in a Twin Pregnancy (Sur un cas d'hydramnios à march aigu dans une grosse gémellaire). *Ann. de gynéc. et d'obst.*, 1916, xlii, 376.

Cases of rapidly progressive hydramnios are relatively rare. Up to 1911 Jais collected 48 published cases. A few more have since been published. Chambrelent reports a case in a III-para. The first labor was normal, the second pregnancy was accompanied by hydramnios but of slow evolution, and labor was at term. There was a large quantity of fluid; precidentia of the cord; breech presentation with living child. The present pregnancy showed nothing abnormal at the end of five and one-half months. Then suddenly within a few days abdominal distention became exaggerated. The height of the uterus was 43 cm. the umbilical circumference 123 cm. After examination Chambrelent diagnosed hydramnios with the possibility of twin pregnancy. The symptoms and abdominal volume having increased intervention was determined on about the seventh month. Twin foetuses weighing 2,640 and 3,060 grams, respectively, were delivered. There was some œdema of the extremities and cord which disappeared. The placenta weighed 1,650 grams; it was composed of two juxtaposed masses. Six to seven liters of amniotic fluid escaped during the maneuvers. The after-course was normal. The author points out that it is unusual to deliver a living child in cases of acute hydramnios.

W. A. BRENNAN.

Planchu: Intestinal Occlusion Provoked by the Gravid Uterus at the End of the Eighth Month (Syndrome d'occlusion intestinale provoqué par l'utérus gravide à la fin du 8e mois). *Ann. de gynéc. et d'obst.*, 1916, xlii, 374.

Cases of intestinal occlusion caused by compression of the gravid uterus are extremely rare. Planchu reports a case in a primipara of 36 years at the end of the eighth month. There was accentuated meteorism, total absence of stools and

gas for 24 hours, nausea and vomiting every three hours. Lavage and purgation had no effect. After two days, during which the symptoms were intensified, the diagnosis of occlusion was made with certainty. The foetus was living. As the general state was good it was decided to delay surgical intervention for 24 hours and to utilize this time for the induction of labor, which was accordingly done, the expulsion being spontaneous. Immediately after expulsion a large quantity of gas was passed, followed shortly by abundant evacuations. The next day conditions were normal. W. A. BRENNAN.

Barnard, E.: Observations on the Occurrence of Urobilinogen and Urobilin in the Urine of Pregnant and Non-pregnant Women. *J. Lancet*, 1917, xxxvii, 80.

A total of 1,005 examinations were made for urobilin in the urine of 244 individuals. Of these, 160 were pregnant and 84 non-pregnant. Of the pregnant cases 148, or 92.5 per cent, showed urobilinuria at one time or other. Subtracting those in which hæmocytolysis or liver disease could not be excluded, reduces the number to 115, or 71.9 per cent.

Of the non-pregnant cases 22, or 26.2 per cent, had urobilinuria. Of these, 17 cases had diseases which might produce changes in the liver or blood-cells, leaving 5, or 0.2 per cent.

In the non-pregnant, indican occurred in 26, or 30.9 per cent.

In the pregnant, urobilin and indican were present in 72 cases, indican occurring in 48.6 per cent of the cases in which urobilin was present.

In the non-pregnant, urobilin and indican were present in 12 cases, indican occurring in 54.5 per cent of the cases in which urobilin was present.

Of the 844 tests made of the urine in the pregnant cases, 174, or 20.6 per cent, were positive for indican, and 530, or 62.8 per cent, were positive for urobilin.

Urobilin and indican were positive 140 times, or 26.4 per cent of tests positive for urobilin were also positive for indican.

Of the 161 tests made of the urine of the non-pregnant, 34, or 21 per cent, were positive for indican, and 28, or 18.6 per cent, were positive for urobilin.

Urobilin and indican were positive 13 times, or 46.7 per cent of tests positive for urobilin were also positive for indican.

Other conclusions formed were that there are marked variations in the amount of urobilin excreted daily; there are extrahepatic sources of bile pigment; it is possible that urobilin can be derived from other substances than the hæmoglobin.

Urobilinurine of pregnancy may be physiological, incident to increased metabolic processes in the liver and to heightened activity of the blood-forming and other organs, and possibly to the nature of the diet.

It appears certain that when such factors as the

condition of the portal and general circulation, the eliminative power of the kidneys, the functional activity of the liver, the normal fluctuations of the bile and bile-pigment secretion, the integrity of the hepatic cells, the rate of hæmoglobin destruction, the extrahepatic formation of bile pigment, the condition of the gastro-intestinal tract, the diet, and the unknown factors of hæmoglobin metabolism, must be considered, the qualitative estimation of the urobilin is of little value. W. F. HEWITT.

Terrades, F.: Gynecologic Operations of Urgency Due to Pregnancy (La urgencia operatoria ginecológica determinada por el embarazo). *Arch. de ginec., obst. y pediat.*, 1917, xxx, 47.

The author reports the following cases operated upon during pregnancy: 4 cases of ovarian cysts, 2 cases of myoma, 1 suppurative affection of the adnexæ, and 4 cases of disease of the external genitalia.

In the first group the duration of the pregnancies varied from two to three months. All went regularly to term without complication.

In the second group the patients were respectively two and three months pregnant. One aborted and the other went to term.

In the third group the patient was three months pregnant and aborted twelve days after operation.

In the fourth group the pregnancy duration varied from two to five months. Three of the four patients went to term without complications and one aborted. W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Cathala, V.: Dystocia Due to an Isthmian Hysteropexy (Accouchements dystociques dus à une hysteropexie isthmique). *Ann. de gynec. et d'obst.*, 1916, xlii, 360.

In the case reported by Cathala the first labor was normal. There were five further pregnancies subsequent to a direct hysteropexy. All these terminated in dystocia with death of the foetus. The last pregnancy was ended by a cæsarean operation with a living child.

The hysteropexy done in this case was a low one made at the uterine isthmus and not in the uterine body. The cause of the dystocia appears to have been the immobilization of the uterine neck in an abnormally elevated position which has presented an obstacle to the accommodation of the foetus. Moreover, the adherence of the anterior wall at the site of the isthmus has interfered with the enlargement of the lower segment as well as with the action of uterine contraction on the neck. W. A. BRENNAN.

PUERPERIUM AND ITS COMPLICATIONS

Brinkley, A. S.: Further Observations upon the Surgical Treatment of Puerperal Septicæmia. *N. Y. M. J.*, 1917, cv, 487.

Brinkley records further experience with the Pryor operation for puerperal septicæmia and illustrates the special instruments and the steps neces-

sary in this surgical procedure. He reviews briefly the lymphatic system of the uterus, which consists of three sets of vessels that converge and empty into the subperitoneal tissue from which collecting trunks take origin and drain into the inguinal, iliac, sacral, and juxta-aortic glands. With this operation, the cavity of the uterus is carefully explored and swabbed with tincture of iodine, any remaining débris being gently removed. The posterior lip of the cervix is then caught with tenaculum forceps and the cul-de-sac opened with scissors. The gloved finger is introduced for exploratory purposes and the opening enlarged by dilatation. Any pus or serum is sponged out. The patient is then placed in the Trendelenburg position so the loops of intestines will gravitate out of the way and, with the proper retractors in position, the pelvis is packed with iodoform gauze, folded to make loose rolls. These rolls are carried up to the level of the broad ligament and the end of each roll protrudes into the vagina. This packing is removed gradually, beginning on the third or fourth day. The general treatment for sepsis is instituted, saline solution being given by rectum together with hypodermoclysis of salt solution. Brinkley reports two illustrative cases both of whom were very ill with pulse from 150 to 160; both recovered after operation.

Chaput, H.: Three Cases of Severe Puerperal Infection Cured Without Hysterectomy by a Uterine T-Incision and Abdominovaginal Drainage (Trois cas d'infection puerpérale grave guéris sans hystérectomie par l'incision utérine en T et le drainage abdomino-vaginal). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 353.

Chaput reports three cases of severe puerperal infection, one with subacute metritis, salpingitis, and generalized peritonitis, the other two with infected placental detritus and peritonism without peritonitis. These cases recovered readily after an uterine T-incision and filiform abdomino-uterovaginal and abdominovaginal posterior drainage. As the three patients showed signs of peritonitis, uterine curettage by the lower route was contra-indicated and laparotomy alone was indicated to verify the condition of the peritoneum, etc.

The technique of the T-incision is simple. If time is an object incision of the vesico-uterine cul-de-sac may be dispensed with. Chaput incises the anterior uterine wall on the median line from the fundus to the vesico-uterine cul-de-sac; he then opens up the uterine horns with the scissors as far as their extremities, draws back the lips of the incision with retractors and inspects the cavity. If there is no septic metritis he cures; if the placenta is retained and infected it is resected; when the mucosa and uterine muscle are gangrenous over a large area it is preferable to execute a total abdominal hysterectomy.

Before draining the uterus through the vagina the neck must be dilated with Hegar's bougies, to No. 15.

Besides the partial T-incision, just described, the complete T-incision may be done by incising the vesico-uterine cul-de-sac, exposing the bladder and incising the uterus down to and including the vagina. This is preferable to the partial technique, as it gives better drainage and permits good disinfection when the neck is infected. It is best not to suture the uterine incision because it predisposes to infection of the muscular wound.

An open abdomino-uterovaginal drain is placed in the uterus and vagina and a rubber strip is introduced between the uterine edges. The uterine fundus must be sutured to the abdominal wall to obviate uterine secretions reaching the peritoneum. It is well to drain the vesico-uterine cul-de-sac specially with an open abdominopelvo-anterior drain. The Douglas filiform drain not having the inconveniences of tubular drains, Chaput considers it very valuable for open abdominovaginal posterior drainage.

The author states that the uterine T-incision gives recovery of puerperal infection without hysterectomy whenever the organ is not attacked by lesions incompatible with its preservation. It is indicated when septic metritis exists and placental retention with infection or gangrene. It is contra-indicated in cases of extensive gangrene, purulent muscle infiltrations, and phlebitis.

W. A. BRENNAN.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Means, J. H., and Rogers, O. F., Jr.: Observations Upon a Case of Extreme Acidosis Occurring in a Man with Bilateral Cystic Kidneys. *Am. J. M. Sc.*, 1917, cliii, 420.

A study of the acidosis concurrent with uræmia was made by these authors. Some of the chemical analyses were made by Dr. John Howland. The acidosis was one of retention rather than of production as is shown by the low renal function tests and the low index of urea excretion together with the high phosphates and non-protein nitrogen of the blood and the autopsy finding of almost total absence of normal renal tissue. The calcium content of the blood was very much reduced — to less than one-third of the normal.

MAX KAHN.

D'Agata, G.: Anatomico-Clinical Considerations on a Case of Suppurative Hæmatogenous Nephritis with Cystic Valvular Ureteritis (Considerazioni anatomico-cliniche su di un caso di nefrite suppurativa ematogena con ureterite cistica valvolare). *Clin. chir.*, Milan, 1916, xxiv, 985.

The author gives a detailed macroscopical and histological study of a case of infection of the urinary apparatus, which ordinarily might well be considered as an ascending uretero-pyelonephritis. But from the clinical history and histopathological findings the author believes that he is entitled to state that the path of infection in this case was through the blood and not through the urinary passages. He refers to a somewhat analogous case reported by Burci in 1902 in which the patient showed an ureterovaginal fistula following a vaginal hysterectomy. Twenty days after operation there was a manifestation of a renal suppurative process which it seemed rational to interpret as an ascending pyelonephritis by infection from the ureterovaginal fistula. Burci, however, by clinical considerations confirmed by anatomopathologic findings was obliged to admit that the infection was undoubtedly by the blood; and therefore he established a fact of great importance, viz., the possibility of a suppurative process of the kidney being effected through the blood, even when there are pre-existing alterations in the ureteral tube which generally and wrongly are referred to as ascending pyelonephritis.

D'Agata thinks that the specially favorable condition which leads to renal localization is the relative urinary stasis which is produced and maintained by special anatomic and functional alterations in the ureters and which principally consist in the presence of cystic formations and transverse mucous folds which are of the nature of valves.

D'Agata calls special attention to the importance of these valve-like folds in urological practice, because owing to their particular disposition while they do not offer any hindrance to the elimination of uro-purulent products they form an obstacle to the passage of the ureteral sound as it ascends, which may be arrested in one of the tubular cavities constituted by the mucous folds. W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Kanavel, A. B.: Transplantation of Fascia Lata in Exstrophy of the Bladder; Complete Defects in the Abdominal Wall, and Spina Bifida. *Surg. Clin.*, Chicago, 1917, i, 153.

Transplants of fascia lata are valuable in the repair of defects which otherwise are not amenable to plastic repairs.

Autoplastic transplants are superior to fascia taken from other individuals. In the latter case an agglutination test of the blood should be done to rule out a possible cytotoxicity.

The fascia lives in regions with scanty blood supply, hence it is better to provide if possible a well-vascularized area. Two layers are never placed in juxtaposition.

An aseptic field is highly desirable though transplants in septic fields will at times survive. If the fascia is transformed to connective tissue this does not stretch and lose its viability as such tissue ordinarily does.

Fascia lata is the best source. The thigh defect in the fascia is then closed as nearly as possible with catgut suture. The edges and corners of the transplant must be carefully tacked down, otherwise the flaps will roll up and become displaced.

The details of the repair in case of an exstrophy of the bladder accompanied by bilateral inguinal hernia are given. In this case a large flap of fascia lata was used.

A case of ventral hernia following suprapubic incision, which had been operated upon eight times previous to coming to this clinic, was cited. In this case a hernia, 8 inches in diameter in which only skin covered the peritoneal pouch, was repaired by a fascial flap 4 by 5 inches from the thigh. The flap edges were sutured beneath the muscle remnants at the hernial edges. Eight months after this operation there was no recurrence. K. L. VEHE.

Kuettner, E.: Infective Gangrene of Penis and Scrotum. *Berl. klin. Wchnschr.*, 1916, No. 33.

The so-called spontaneous gangrene of the penis and scrotum is observed more frequently in war

than in peace. Kuettner has recently observed two cases in soldiers.

In 1911 Coenen and Prezedborski gathered 203 cases of this affection from the world's literature. They divided genital gangrene into 4 groups: (1) gangrene of the penis and scrotum, due to general affections, infective disease, disturbance of nutrition, circulation, etc.; (2) gangrene due to urinary infiltration; (3) gangrene due to mechanical, chemical, or thermic action; (4) gangrene due to local inflammatory processes.

Kuettner considers the fourth group the most important and both his cases belong to this. To this group of cases belong Fournier's cases of true gangrene which have been named fulminatory spontaneous gangrene of the male external genital organs.

The first of Kuettner's two cases was in a man of 39 years. He was seized with pains in the inguinal region. The penis was tumefied and fresh pus issued through the urethral orifice. The Wassermann was negative and gonococci could not be found.

In a short time the skin of the penis became gangrenous, and the process soon spread to the swollen scrotum. When received in the clinic the gangrenous parts had been shed to a large extent, the penis and scrotum being still much swollen. The surfaces cleared up rapidly. The reduced defect was treated by mobilization of the margins and the man recovered, having no genital alteration save the cicatrix.

In the second case the gangrene was limited to the penis. There was spontaneous detachment also in this case without complications. The man recovered with a loss of part of the prepuce.

The affection does not always end so favorably. In Coenen's and Prezedborski's collected cases the mortality was 22.1 per cent. W. A. BRENNAN.

GENITAL ORGANS

Thomas, B. A.: Technique of and Observations on the Operation of Vasopuncture and Medication for Seminal Vesiculitis. *Surg., Gynec. & Obst.*, 1917, xxiv, 68.

Thomas directs attention to the importance of chronic seminal vesiculitis as a frequent, important, and commonly overlooked cause for many systemic and local arthritic and nervous disorders commonly treated by the internist, the orthopedist, the neurologist, and psychiatrist.

The anatomical relationship of the seminal vesicles, as well as their interior anatomy, also that of the ampullæ of the vasa deferentia and the ejaculatory ducts, are given due consideration. Allusion is made to the various methods, conservative and radical, concerned in the treatment of seminal vesiculitis, but the object of the paper is particularly to direct attention to the technique of an operative procedure — vasopuncture and medication — which the author briefly described two years ago, but which

now is fully described with certain improvements in technique.

Thomas does not claim that the operation, *per se*, is a "cure all" for the majority of patients afflicted with this intractable disease, and fully appreciates the fact that in a certain number of cases vesiculotomy or preferably vesiculectomy, if the latter can be rendered more feasible, should be employed in preference to any other form of treatment. He believes, however, that there are many patients subjected to vesiculotomy who might be spared the trials of this more or less formidable operation by resort to vasopuncture and medication of the vesicles. He calls attention to the fact that vesiculotomy is not always a curative procedure and that it is not always well or properly done, indeed in many cases it is impossible of perfect accomplishment. In the author's experience about 70 per cent of his cases of seminal vesiculitis have been rendered free from symptoms, if not cured, by massage, irrigations, and the well-recognized methods of treatment. In the remaining 30 per cent approximately 40 per cent were cured and over 50 per cent improved: no improvement was noted in 10 per cent.

Dakin, W. B.: Prostatectomy; a Clinical Study of Fifty Cases with Particular Reference to Post-operative Treatment. *Surg., Gynec. & Obst.*, 1917, xxiv, 120.

The author discusses the pre-operative complications and postoperative conditions as they developed in 50 cases of prostatectomy; the average age was 68 years, the youngest 43 years, the oldest 93. The pre-operative treatment averaged a little over two and one-half weeks, the longest period being two months. The chief necessity of pre-operative treatment is the establishment of bladder drainage. Five of the cases had suprapubic puncture as it was impossible to pass a catheter.

Complications of other organs of the body. In order of frequency, arteriosclerosis, renal insufficiency, inguinal hernia, myocarditis, valvular trouble, asthma and bronchitis, vesical calculi (one of the three cases having 34 stones), epithelioma of the face, cirrhosis of the liver, double hydrocele, sacral decubitus, and two cases of diabetes, one having 2.5 per cent sugar. Both diabetic cases recovered.

Rectal examination was found to be a poor indicator of the real amount of prostatic tissue present. Four cases showed marked deficiency to the phthalein test; of these, 3 recovered but the fourth died. The anæsthetic used was spinal or nitrous-oxide oxygen; the operations were all suprapubic.

In the postoperative treatment he warns against inserting the suprapubic tube too far into the bladder and advises against using salt solution in the rectum. The second day he recommends that the suprapubic tube be removed and a small catheter inserted into the urethra. Only five cases in the series were unable to comfortably carry the urethral catheter. He recommends that clean bladders be

irrigated every second or third day and infected bladders be irrigated every day.

A most striking fact as to the efficiency of these methods is shown by the average time of closure of the bladder wound, which was nine days, and complete closure of the abdominal wound was seventeen days.

V. D. LESPINASSE.

Squier, J. B.: The Postoperative and Convalescent Period of Prostatectomy. *J. Am. M. Ass.*, 1917, lxxviii, 616.

The author calls attention to the value of estimation of urea and creatinin for the prognosis of operative cases.

The bladder is not irrigated for at least 24 hours after the operation. All methods of suction and aspiration to keep the bladder empty are considered unwise.

The bladder at the time of operation is sutured accurately but loosely. Water by mouth is administered as soon as the postanæsthetic nausea has subsided. Hot water in small amounts is better borne than cold. Thirty-six hours after operation a brisk dose of castor oil is given, followed in six hours, if necessary, by a high colon saline irrigation. One dose of morphine may be given on the first day; but its use must not be continued.

The critical phase is somewhere between the 24- and the 72-hour period. Persistent nausea may indicate the beginning uræmia, and the data derived from a chemical examination of the blood are here invaluable. The prompt use of the stomach-tube and castor oil with colon irrigation will pull many a patient through. If there be arrhythmia, infusion of digitalis is added to the Murphy drip.

After twenty-four hours the bladder is irrigated several times a day. The tube is removed after from four to six days, depending on conditions. Early feeding, early getting out of bed, free use of urotropine, and avoidance of all urethral instrumentation are other important points. But it must be remembered that these patients are old men and that they must not be tired out under the pretense of keeping them out of bed. FAXTON E. GARDNER.

Gardner, J. A.: Postoperative Treatment of Patients Following Prostatectomy. *J. Am. M. Ass.*, 1917, lxxviii, 614.

The pre-operative preparation of the patient is the most important part of the postoperative care. The two-step operation must always be selected, the less irrigation and the less disturbance of the bladder after the second operation the better.

If Hagner's bag has been used, it is better to wait 48 hours before removal. At the end of 24 hours, the one can begin to remove packing, taking away a little every four hours. The large Marion tube is removed on the third day and replaced by a smaller de Pezzer catheter, the wound being strapped. Patients should sit up in bed on the third day.

A cork may then be inserted in the catheter and the patient encouraged to void naturally, but without distending the bladder. The de Pezzer catheter is left until the wound is solid, which takes about two weeks. It is then removed and the fistula closes in a few days.

The urine should be watched for marked alkalinity, which calls for acid sodium phosphate and lactic acid bacilli. The skin is protected against irritation by equal parts of balsam of copaiba and castor oil. The Murphy drip should not be used. Instrumentation of any kind in the lower bowel is contra-indicated following prostatectomy.

FAXTON E. GARDNER.

MISCELLANEOUS

Salzer, M.: The Handling of Hazardous Genito-Urinary Risks for Operations Under Anæsthesia. *Am. J. Surg.*, 1917, xxxi, 2.

The author divides his subject into three heads: (1) the preparation of the patient, (2) the anæsthetic itself, (3) the after-treatment.

1. In the preparation of the patient he recommends that functional tests be carried out in all cases. If the test is low the fluid intake should be increased by Vichy or any other alkaline water. This is continued until the urine is persistently alkaline to methyl red. While this alkalization is going on the patient's bowels are carefully attended to and it is seen to that they move regularly every day. No drastic purgation is given. An enema is given immediately before operation and the blood-pressure is carefully observed. One-eighth of a grain of morphine and 1/300 of a grain of atropine are given at half-hour intervals one hour before operation.

2. As to the anæsthetic to be used, the author recommends local anæsthesia, but advises nitrous-oxide oxygen as a routine.

3. The after-treatment consists again in the pushing of the alkaline waters. As soon as the patient is conscious, which occurs almost immediately after the nitrous-oxide anæsthesia, he is allowed to have Vichy water. Rarely, if ever, is there nausea following a nitrous-oxide-oxygen anæsthesia and consequently the intake of alkaline waters can be pushed from the start. Fischer's solution is given immediately per rectum by the drop method and is continued as long as it causes the patient no discomfort, and is started again as soon as possible. Pituitrin hypodermically and Fischer's solution intravenously are our mainstays should there be the slightest evidence of impending shock or scanty urinary secretion following the operation.

Complications have been strikingly absent. In no case has there been any disturbance of the urinary secretion sufficient to cause any alarm. Respiratory tract complications have been entirely absent.

V. D. LESPINASSE.

SURGERY OF THE EYE AND EAR

EYE

Dixon, G. S.: Radiography of the Eye and Orbit. *N. Y. St. J. Med.*, 1917, xvii, 67.

In discussing this subject so pertinent at this time when army surgery is so much to the fore, Dixon emphasizes clearly the value of X-ray examination in all cases of foreign body in the globe; in tumors and fractures of the orbit. Of the frequently found bodies wood alone does not give a shadow. Localization by the author's method has been very satisfactory. Care in keeping the eye quiet, the necessity for multiple exposures to avoid defects in the plates, and other points of importance are touched on. Iron and rust only may give a shadow of good form and density.

The presence of prolapsed iris or the statement of the patient in regard to the accident indicate little. Failure to find a wound of entrance does not exclude the presence of a foreign body. Cataract or siderosis are indicative. A second series of plates after removal will exclude or reveal the presence of a second foreign body.

Intra-ocular tumors have been shown by X-ray, but orbital tumors may be outlined if not too diffuse and if projected so as to exclude the opposite orbit.

Fractures are unsatisfactorily demonstrated unless of the outer wall.

E. B. FOWLER.

EAR

Fraser, J. S.: Injuries of the Middle and Inner Ear in Fracture of the Cranial Base. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Otol., 20.

Concerning the frequency of this complication, the author quotes Brun that there is disturbance of hearing in 14 per cent of skull injuries and in 24 per cent of basal fractures.

Concerning the direction of the line of fracture it is stated that it may run parallel to the long axis of the petrous bone or at right angles to the long axis.

Longitudinal fractures as a rule start in the orbital region of the sella turcica, and pass backward along the line of the middle ear cleft, breaking the roof of the eustachian tube and tympanic cavity. The fracture may then pass outward to the external meatus and squamous region; if this is the case the inner ear is not involved, although the ossicles may be dislocated and the drum head torn. On the other hand the fracture after reaching the roof of the tympanic cavity may pass inward through the petrous pyramid, and thus resemble in some respects those fractures which run at right angles to the long axis of the petrous bone. The inner ear is of course involved in these latter cases. (The author reports

a case belonging to this type.) Two genuine transverse fractures of the petrous pyramid run at right angles to the long axis of the pyramid and always injure the labyrinth. As a rule the fracture passes through the external meatus roof of the tympanic cavity, vestibule, and internal auditory meatus, as this is the line of least resistance. However, the fracture may pass further back when the canals are involved.

If the patient survives the injury he is not out of danger, as meningitis may supervene as the result of infection from the middle ear spaces or from contamination of the blood in the external meatus and tympanic cavity. Such a complication is more likely if the labyrinth is involved in the fracture.

The author adds two detailed case reports with postmortem findings, both gross and microscopical.

OTTO M. ROTT.

Duel, A. B.: Suppurative Labyrinthitis; a Critical Review of Its Diagnosis and Treatment. *Boston M. S. & J.*, 1917, clxxvi, 345.

Critically reviewing the various tests for determining the functional activity of the internal ear, the author states that only two are necessary, namely, the caloric test for the static apparatus and the noise apparatus for the cochlear apparatus. All other tests such as the turning, the galvanic, and the fistula tests are condemned as being indefinite if not absolutely harmful. No information can be obtained from the latter to assist in determining the necessity for surgical interference that can not be more safely and more satisfactorily obtained from the former. The author condemns the routine use of all known tests simply to elicit phenomena which one knows before will be present. Nothing but harm to the patient may result and hence their use is discouraged.

Concerning the question of the finer distinctions in making a diagnosis as to the clinical type of labyrinthitis presenting itself, the author states that more harm than good results from our efforts to make such a distinction.

The question which confronts one is, Is this acute or chronic? If acute, there are manifest symptoms, which are well known. If any function is still present in either the cochlear or the vestibular portion, it is safe to say that an acute suppurative endolabyrinthitis, at least of an operative character, is not present at that moment. If both functions are ablated, the case may or may not be one of acute suppurative endolabyrinthitis. Hence, if there are no symptoms outside of the labyrinthitis, it is safer not to operate, but dangerous as an operation would be at this stage the author thinks it more dangerous to

subject the patient to all the confirmatory vestibular tests. Absolute quiet is demanded, and close observation enjoined, and if meningeal symptoms begin to supervene in addition to the labyrinthine, then operation is demanded.

The meningeal symptoms referred to are temperature of over 100° accompanied by headache, photophobia, exaggerated reflexes, positive Kernig's sign, pontine findings in the spinal fluid. Concerning the chronic form, which is demonstrated by the presence of absolute deafness and no vestibular reaction to the caloric test, the author does not believe in opening the labyrinth at the same time that the radical mastoid operation is performed unless a fistula is found.

In the acute cases the dura should be drained at the same time that the labyrinth is opened. In the chronic cases without evidences of meningeal involvement, the surgery can be confined to the labyrinth itself.

In closing the author offers a slight amendment to Rae's classification of labyrinthitis.

1. Acute endolabyrinthitis.
2. Chronic endolabyrinthitis.
3. Paralabyrinthitis.
 - (a) with fistula.
 - (b) without demonstrable fistula.

OTTO M. ROTT.

Watson-Williams, P.: Case of Chronic Adhesive Otitis; Myringotomy and Partial Ossiculectomy. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Otol.*, 1.

Before operation loud whispers were heard with the right ear at 28 inches and with the left ear at 20 inches. After eustachian catheterization hearing had improved to right 54 inches and left 36 inches.

One month later the hearing was right 88 inches and left 38 inches.

Three months subsequently under gas anæsthesia the author made a crucial myringotomy of the left

ear. Immediately after recovery from the anæsthetic the patient's hearing was improved to 7.5 feet — left. One month later hearing was 24 feet with the left ear and the left membrane was then freely excised and the lower half of the handle of the malleus removed.

The question raised is, Is this improvement permanent? In the discussion that followed the consensus of opinion was that the ultimate result in these cases is far from what the immediate result would lead one to expect.

OTTO M. ROTT.

Barnhill, J. F.: The End-Results of Treatment of Chronic Suppurative Otitis Media. *J. Am. M. Ass.*, 1917, lxxviii, 13.

The author mentions the following factors as influencing the end-results of the surgical treatment of chronic suppurative otitis media:

1. Age of the patient.
2. Condition of the nose, nasopharynx, and pharynx.
3. Nature and violence of the original aural infection.
4. The presence of complications at the time surgical measures are attempted.
5. The period of the disease in which the operative attempt to cure is made.
6. Physical condition of the patient.
7. Skill and judgment of the operator.
8. Efficiency of the after-treatment.
9. Co-operation of the patient, particularly after discharge from the hospital.

The author closes with a statement (1) as to the effect on the hearing, concerning which no improvement is expected; (2) as to the cure of the suppuration, which occurs in 90 per cent of cases; and (3) as to the mortality of the patient, more danger to life being due to delay in operating than to the operation itself.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Alexander, G. J.: Infiltration Anæsthesia for Removing Adenoids. *J. Ophth., Otol. & Laryngol.*, 1917, xxiii, 157.

The advantages of performing adenoidectomy with local anæsthesia are the safety, simplicity, and speed with which the operation can be performed with the co-operation of the patient in the upright position; absence of pain, slight hæmorrhage, and small expense to the patient.

After anæsthetizing the posterior faucial pillars, soft palate, and postnasal space with applications of a 20 per cent solution of cocaine, the surgeon injects into the submucous tissues of the postnasal space under the adenoids, 3 to 4 ccm. of a 1 per cent solution of novocaine containing three drops of adrenalin chloride 1:1000.

The injections are made with a 2-ccm. glass record syringe with a specially constructed hollow needle 12 centimeters in length and curved upward at its distal end.

The points for infiltration are one on either side high up in the postnasal space or upper end of the Rosenmueller fossæ, reached by placing the needle against the soft palate, pushing it upward, and plunging the needle through the entire body of the adenoid tissue to the submucous tissues beneath and one just behind the soft palate in the posterior wall of the pharynx in the median line.

ELLEN J. PATTERSON.

Weinstein, J.: Nature and Control of Hæmorrhage in Nasopharyngeal Operations. *Laryngoscope*, 1917, xxvii, 145.

The author discusses the procedures involved in dealing with nasopharyngeal hæmorrhages, under preventive, surgical, and medical headings.

The preventive methods consist in:

1. A careful study of the general condition of the patient so as to reveal any constitutional conditions favoring a hæmorrhage from the much feared hæmophilia to diseased kidneys with consequent high blood-pressure.

2. Such mastery of technique as shall result in the choice of the method best adapted to the individual case, including a study of the local anatomical situation as well as choice of a proper anæsthesia.

Surgical methods advised in cases of postoperative hæmorrhage following operation upon the tonsils and lateral wall of the pharynx are:

1. Application of Mikulicz's compression forceps.
2. Sewing together of palatal arches.
3. Compression of common carotid artery.
4. Ligation of common carotid artery or its branches.

Based upon the commonly accepted causes of hæmorrhage, viz, high blood-pressure, persistent vasodilatation, and delayed blood-clotting, the therapeutic measures employed in the control of hæmorrhages are of three kinds:

1. Those equalizing the circulation and lessening the intravascular pressure at the bleeding point.
2. Those contracting the vessel itself.
3. Those decreasing the coagulation time of blood.

The author has had extremely gratifying results with the hypodermatic injection of one-half grain of emetine. This is done as a matter of routine, since his tests showed that fifteen minutes after injection, the bleeding time was reduced by one-third. Pituitrin gave about the same results; likewise coagulin cila, thromboplastin, and coagulose.

OTTO M. ROTT.

Ferero, A.: Treatment of Chronic Maxillary Sinusitis and the Application of Local Anæsthesia to the Radical Operation of Caldwell-Luc (Sobre el tratamiento de la sinusitis maxilar cronica y la aplicacion de la anestesia local a la operacion radical de Caldwell-Luc). *Rep. de med. y cirug.*, Bogotá, 1917, viii, 147.

The author reports three cases of radical operation for chronic maxillary sinusitis which were done under local anæsthesia with highly satisfactory results. Complete anæsthesia was obtained from one injection of novocaine and the local application of tampons steeped in a 10 per cent solution of cocaine hydrochlorate with some drops of normal adrenalin solution added.

W. A. BRENNAN.

Patton, W. T.: The Submucous Resection of the Nasal Septum. *South. M. J.*, 1917, x, 253.

To obtain anæsthesia, the author prefers the injection method with 1 per cent novocaine or No. 1 Schleich solution, adding 15 minims of adrenalin to the ounce; care is taken to inject the solution at eight points between the perichondrium and cartilage, four on each side. The first injection is made just in front of the proposed incision, above and another one near the floor. The next point is opposite to the middle turbinate and then near the floor. Advantages claimed for the injection method are: (1) it is much quicker; (2) it thickens the membranes and makes tearing less common; (3) it aids a great deal in separation; and (4) the toxic symptoms are much less and the anæsthesia is more perfect.

As regards technique, the author prefers the Hurd forceps for removing most of the septum. He cautions against removing the bone too high and too far forward. To prevent formation of

hæmatoma between the flaps, a small cut is made through the membrane, posteriorly and near the floor, for drainage, after which the flaps are held in contact by means of the author's septal clamp which consists of two steel blades, fastened with a spring. The blades come together with just sufficient force to hold the flaps together.

OTTO M. ROTT.

Leshure, J.: Septal Hæmorrhage; Its Cure by Submucous Elevation. *Am. J. Surg.*, 1917, xxxi, 75.

The steps of the procedure are as follows:

1. Indication of analgeso-ischæmia by means of the application of cocaine adrenalin.
2. Incision and elevation of the septal mucoperichondrium backward for one inch and down to the floor of the nose.

3. Compression of the elevated membrane between the blades of a special forceps.

4. Replacement of the flap and packing in the usual manner for from twelve to twenty-four hours.

Indications for the operation are:

1. Cases of septal hæmorrhage which resist ordinary methods of treatment, such as cauterization, astringents, etc., and those in which no bleeding point can be readily found.

2. Cases of chronic crusting of the septum accompanied by bleeding.

3. Cases of septal hæmorrhage of mild or severe degree in children who will not tolerate local treatment and who are best operated upon under general anæsthesia.

OTTO M. ROTT.

THROAT

Sebilleau, P.: Technique of Methodical Extirpation of the Larynx Under Local Anæsthesia (Technique de l'extirpation méthodique du larynx pratiquée sous l'anesthésie locale). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 473.

In 1910 Sebilleau published his technique for extirpation of the larynx under general anæsthesia. He now describes the same operation done under local anæsthesia.

The line of incision is first traced on the surface. The teguments are then anæsthetized by current methods. All accessible parts of the laryngo-tracheal tract, i.e., its anterior and lateral faces from the hyoid bone to the manubrium, are suffused with a 1:200 solution of 20 ccm. of novocaine with adrenalin added.

In a laryngectomy with closed trachea there is as a general rule no trouble as regards the patient's respiration. In the case of an open trachea Sebilleau first removes the cannula carried by the patient; then anæsthetizes the trachea with cocaine solution 1:10. A long rubber tube as thick as possible is introduced into the tracheal opening and is pushed for some centimeters into the respiratory tract. Then it is fixed by a few sutures to the skin surrounding the tracheal orifice. Two vertical and parallel incisions, following the tracheal conduit and on either side about 3 cm. from the sagittal line, extend from the hyoid bone to the suprasternal hollow and form thus a long and narrow rectangular strip in front of the laryngeal conduit. This rectangle is dissected as far as the limits of the tracheal orifice, there being little hæmorrhage as the region is bare of vessels. The strip of skin which is only adherent at the tracheal opening is then lifted up and wrapped tightly about the rubber tube and the edges hermetically sutured along its length so that no blood can enter the trachea. The methodical extirpation of the larynx is then proceeded with.

The cutaneous resection facilitates the laryngeal resection and there is usually sufficient material left to suture over the operative field at the end of the operation, because the removal of the larynx materially reduces the surface to be covered.

In the extirpation of the larynx, the author follows Perier's method as modified by him and described in 1910.

W. A. BRENNAN.

MOUTH

Mitchell, V. E.: The Artificial Restoration of Lost or Missing Tissue in Congenital Cleft Palate—a New Device. *Am. J. Surg.*, 1917, xxxi, 57.

The closure of the cleft palate, even if surgically successful, unless it restores the functions of the tissue, invariably leaves the patient worse off than before, and also frequently prevents satisfactory subsequent treatment.

With this principle in view, the author has devised his appliance not only to restore the missing tissue but to permit its normal function.

After having the appliance fitted, the patient is trained through the principles of the Miller vocal art science to co-ordinate the muscles of the body and harmonize its sympathetic nervous system, which finally results in an automatic control of speech, voice, and correct diction.

ELLEN J. PATTERSON.

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SURGERY OF THE CHEST

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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Throat

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INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1917

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Vander Veer, E. A.: Dilatation of the Heart, with Acute Myocarditis Following Abdominal Operations. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The author reports six cases of gall-bladder and appendix disease in which the heart before operation was apparently normal, but which, from 36 hours to two weeks after operation, though the patients had been convalescing nicely, developed symptoms of acute myocarditis with dilatation of the heart.

The author concludes that this heart complication is due to secondary infection, operation exciting these peculiar colonies of streptococci lying in the gall-bladder and starting them on their journey, and that they have a selective affinity for the heart muscle.

The suggestion was that a stock vaccine or anti-toxin be developed from the gall-bladder or other abdominal organs involved, and that this be used in cases of this sort; that cultures from the bile be made in every case of cholecystitis, appendicitis, or other abdominal disease, and held in reserve for such a complication. It is the author's intention to have a series of experiments along these lines conducted at the Bender Hygienic Laboratory.

Lewisohn, R.: Modern Methods of Blood-Transfusion. *J. Am. M. Ass.*, 1917, lxviii, 826.

Lewisohn considers that the citrate method of blood-transfusion has simplified the technique of this procedure to a point where it can be mastered easily by any physician.

Through a cannula of large diameter the blood is drawn from the donor into a graduate containing a 2 per cent sodium citrate solution. The quantity

of solution is sufficient so that the resultant mixture of citrate solution and blood will contain 2 per thousand of citrate, or slightly more. Thus, if 450 ccm. of blood are to be injected 50 ccm. of the solution are placed in the graduate.

The mixture is infused into the recipient through a cannula by means of an ordinary salvarsan apparatus, into which 20 ccm. of normal saline has first been poured.

ALBERT EHRENFRIED.

Hedon, E.: The Transfusion of Washed Corpuscles and the Transfusion of Defibrinated Blood (La transfusion des globules lavés et la transfusion du sang défibriné). *Presse méd.*, 1917, p. 129.

In 1902 the author demonstrated that when a sufficiently large quantity of blood was withdrawn from an animal so that a transfusion of physiologic serum could not restore it, the animal could be saved if, to the transfusion fluid, were added a certain proportion of red globules of the same animal or of an animal of the same species, previously washed and having every trace of interstitial blood serum removed from it by repeated centrifugation.

This method, however, does not appear to have been applied in human practice either because it was ignored or judged useless and dangerous.

Recently experiments have been made similar to the author's to prove that globules previously washed and emulsified could be transfused in artificial serum, and exsanguinated animals thereby restored. It is known that defibrinated blood is toxic and further experiments have been made to find the conditions under which even small doses are dangerous and when large doses may be injected with impunity. The author's article deals with these conditions.

Hedon is of the opinion that defibrinated blood

is perfectly utilizable for transfusions in hæmorrhage. What is known at present regarding its toxicity and the conditions that diminish this toxicity permits the establishment of certain rules to regulate the transfusion. Defibrinated blood must never be used fresh, but only several hours after its collection (twenty-four hours if it is kept cold), passed through filter paper previously soaked in salt water, which lessens the toxicity; then it is diluted in a certain quantity of physiological serum to which citrate of soda is added, 3 gr. of citrate to 1000 of blood. Injection is made slowly.

Transfusion of washed globules is also applicable to man, but is more suitable as a disintoxication treatment than as a treatment of severe hæmorrhage. Owing to the employment of a centrifuge the technique is more complex. But the use of the centrifuge may be omitted if necessary. If a large quantity of citrated artificial serum is added to the defibrinated blood and kept cool in a large cylindrical vessel, after twenty-four hours the globules will have become sufficiently deposited so that by syphonage of the overlying liquid the greater part of the serum can be drawn off and the globules then emulsified in a new quantity of artificial serum to be used in transfusion.

W. A. BRENNAN.

Hurwitz, S. H.: Intravenous Injections of Colloidal Solutions of Acacia in Hæmorrhage; Preliminary Note. *J. Am. M. Ass.*, 1917, lxxviii, 699.

Laboratory experimentation suggested to Hurwitz the use of a 5 per cent solution of gum acacia in Locke's solution for the purpose of combating the immediate mechanical ill effects of lowered blood-pressure following excessive hæmorrhage. This solution approximates closely the viscosity of the blood; it is non-toxic and can be easily prepared and sterilized.

In animals it was found that after massive hæmorrhage injection of the acacia solution immediately produced a striking increase in blood-pressure, together with increased fullness of the peripheral vessels, a rise in the pressure pulse, and a more forcible heart-beat. Equal success followed its use in a limited number of patients suffering from hæmorrhage and shock.

In the treatment of hæmorrhage the solution should be given as soon as possible after the onset, and before sufficient time has elapsed for exhaustion of the vasomotor center and for cardiac failure. It should be introduced at a moderate rate and in not too large quantities, in conjunction with other remedial measures.

A. EHRENFRIED.

Rosenthal, M. I.: Occlusive Drainage for Empyema of Chest. *J. Indiana St. M. Ass.*, 1917, x, 135.

The cure of empyema of the chest is brought about, the author states, by the approach and adhesion of the visceral to the parietal pleura and consequent obliteration of the pus cavity.

It occurred to him that the respiratory movement of the diaphragm itself offered sufficient motive

power to evacuate the chest and by resort to a proper valve air could be prevented from entering. To accomplish this he devised the following operation.

The tube is inserted into the chest by means of a specially constructed trocar and cannula, and fixed to the chest by means of adhesive plaster, and left hanging dependent about 24 inches long to act as a discharge tube and at the same time a syphon. The end of the tube was cut at a long angle. Over this was placed a very thin rubber tube somewhat larger than the drainage tube. This tube was tied in place so that it overhung the drain about three inches. The thin tube acted as a valve excluding air from the chest on expiration and allowing the escape of pus and consequent approach of the lung to the ribs on each inspiration. Sterile adhesive plaster was used as the author found it less irritating about the wound and much better tolerated by the skin. The thinner the tube, the better the valve action, he found.

The construction of the trocar and cannula was corrected for the proper insertion of the tube through the chest wall. The cannula, which was made flat and just large enough to allow the tube to pass, was straight, its sides parallel and not tapering, otherwise there was difficulty in passing the tube and in securing an air-tight fit in the intercostal muscles. It did not exceed from $1\frac{3}{8}$ to $1\frac{1}{2}$ inches in length. The author had considerable difficulty in making the instrument makers understand these points. He inserted the trocar just over the upper margin of the rib to avoid the intercostal vessels. He reports no difficulty on account of hæmorrhage in any case.

The operation was performed under local anaesthesia in about one minute. Many patients came for operation in a very much reduced condition, so that the simplicity of the operation added another material advantage.

The author has been performing this operation exclusively since 1910. In nine cases the average time for healing was 31, the shortest time 7 days, and the longest time 96 days.

When the cavity was quite obliterated and there still persisted a slight amount of drainage the tube was removed and a braided bundle of silkworm gut substituted. In a few cases he has poured 0.5 to 1 ounce more or less of sulphuric acid ether through the tube into the chest to act as an antiseptic.

GEORGE E. BEILBY.

Davis, C. B.: Free Transplantation of the Omentum Subcutaneously and Within the Abdomen. *J. Am. M. Ass.*, 1917, lxxviii, 705.

Davis experimentally transplanted pieces of omentum varying from 0.5 to 3 inches in diameter to various abdominal organs, areas denuded of peritoneum, and beneath the skin, for the purpose of determining the value and ultimate fate of omental grafts cut loose from their blood supply.

When properly applied, the results were excellent. They almost invariably adhered wherever they were

transplanted, and remained viable. Wherever a free edge was exposed, there was an enormous production of adhesions, but this could be avoided by accurately turning under all raw edges.

Omental grafts or plugs were applied to severe abrasions and lacerations of the liver and spleen, and the edges sutured. The almost immediate hæmostatis was striking.

A. EHRENFRIED.

Frank, I.: Non-diabetic Acidosis—with Special Reference to Postoperative Acidosis in Children. *Ann. Otol., Rhinol. & Laryngol.*, 1916, xxv, 917.

The points emphasized by the author are:

1. Acetone is found in the postoperative urine of practically all children. This acetonuria produces no symptoms in a great majority of cases.

2. Varying degrees of acidosis or symptom-producing acetonæmia follow anæsthesia in about 20 per cent of cases in children, in individuals predisposed by chronic infections, age, etc.

3. The symptoms of acidosis are such that three degrees of severity are readily apparent.

These are: (a) subacidosis, acetonuria, and rapid pulse; (b) acidosis, acetonuria, diacetic acid in the urine in small amounts, rapid pulse, drowsiness, languor, rapid shallow respiration; (c) acid intoxication, acetone, diacetic acid is markedly present, rapid pulse, drowsiness, nausea and frequent vomiting; heavy acetone breath.

4. Acidosis may be prevented, or its degree lessened, by a carbohydrate diet preceding the operation, by shortening as much as possible the starvation preparation; by the use of nitrous oxide, or a short ether anæsthesia, and by the use of further carbohydrate diet as soon as the patient is in proper condition following operation.

5. Postoperative acidosis in any stage readily responds to solutions of glucose, administered by mouth or per rectum or in very severe cases intravenously, with sodium bicarbonate as a possible valuable adjunct.

OTTO M. ROTT.

Willems: Immediate Active Mobilization for Knee and Elbow War Wounds (Mobilization active immédiate pour les plaies de guerre du genou et du coude). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 394.

Since 1909 Willems has recommended the treatment of hæmarthroses of the knee by puncture and immediate immobilization. He thinks that the present methods of immobilization in the case of knee and elbow injuries are defective. Immobilization as a treatment of articular injuries should be discontinued and replaced by active mobilization which prevents stiffening and muscular atrophy. Fresh wounds of the knee and elbow should be treated by excision of the trajectory, removal of foreign bodies, bone chips, etc., and total closure. Active movements should be pushed as much as possible, and repeated without respite, except in the case of osseous lesions where a displacement of the fragments is to be feared. In knee wounds

walking should be commenced as soon as possible and immediately if the bone injury is slight.

If purulent arthritis should ensue, the sutures should be opened up, arthrotomy performed as needed, and active movements continued. This is the best method of emptying the articulation of its contents. No system of drainage better assures evacuation of septic fluids as they are produced. Passive movements can in no way replace active movements. Articular function will be assured only if it is immediately established in physiologic conditions.

W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Blake, J. B., and Lahey, F. H.: Progress in Surgery. *Boston M. & S. J.*, 1917, clxxvi, 313.

In order to obtain the desired results in disinfection of wounds without causing irritation there must be complete absence of caustic alkali; the concentration of the sodium hypochlorite must be between 0.45 and 0.50 per cent. Complete directions for the preparation of the solution are given in the article. It is important to test the solution frequently in order to discover any alteration which may take place. The stock solution should not be exposed to the light.

The researches in surgical shock which have been carried out by Prof. Porter by animal experimentation and in the study of cases in military hospitals in France are of great interest. His conclusions are that shock is due to subtraction of blood from important centers either by hæmorrhage, internal or external, or by influx of blood into the great veins of the portal system which is capable of great overloading with blood. For practical purposes hæmorrhage and shock are one and the treatment must be directed accordingly. A state of shock exists when the diastolic pressure is 60 mm. or less. Blood then accumulates in the portal veins; the heart activity and the nutrition of the nerve-cells are then impaired.

As to treatment the position of the patient should be such that the abdominal vessels are higher than the heart and brain. Heat should be applied to the surface, intravenous injections of normal salt solution and of adrenal should be given and in certain cases blood-transfusion. Diastolic pressure should be observed every half hour.

There has been considerable work done on the subject of surgery of the heart and pericardium as a result of injury in warfare which indicates that the results of treatment, especially in cases of foreign bodies in the heart and in suppurative pericarditis, has shown some advance.

HORACE BINNEY.

Legrand and Dupont, R.: Study of Wounds by Pyoculture (Etude de blessés par la pyoculture). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 14.

Legrand observed 37 wounds and Dupont 9. Four fresh wounds were found sterile and evolved aseptically.

Although the method of pyoculture is not intended for non-pyogenic microbes, yet it is interesting to note if the method can furnish any valuable findings in infections due to such microbes as the perfringens. The results were bad. Of 5 wounded showing a negative pyoculture all developed except one.

There were 11 cases of wounds infected by pyogenous microbes in which pyoculture was negative. All recovered without complication. There were 7 cases of weakly positive pyoculture. All recovered after more or less abundant suppuration.

Eighteen cases showed abundant positive pyocultures. In all the condition of the patient became grave. It was necessary to incise abscesses, to make wide openings, and in one case to resect the elbow. In only one case was there discordance between the pyoculture and the clinical course.

In commenting on these reports, showing that in all cases where pyoculture was frankly positive extensive surgical intervention was necessitated, Delbet points out that the clinical evolution of the wound confirmed the laboratory prognosis. In one case of a knee wound, with fracture of the patella and of the internal condyle, the patient showed numerous scattered abscesses which were successively incised. But pyoculture always was positive. An injection of magnesium chloride having restored the general condition the surgeon refrained from amputating. A popliteal hæmorrhage followed and in spite of rapid ligature the patient died. Dupont thinks that in this case, seeing the persistence of the positive pyoculture, it would have been better to amputate. Dupont states that in two of his nine cases the negative or weakly positive pyocultures have prevented him from amputating and in both cases the clinical course justified this action.

Delbet thinks that the facts reported by Legrand and Dupont are entirely to the credit of pyoculture in case of pyogenous infections. Only in one case out of 37 was there a failure of the method, viz., 97 per cent of success. W. A. BRENNAN.

Magee, H. E.: A Comparison of Some Antiseptics in Respect to Their Diffusibility, Action on Leucocytes, and Action on Ferment Activity. *Edinb. M. J.*, 1917, xviii, 86.

The author has made a comparative study of the commoner bactericidal agents in regard to diffusibility, chemotactic action, and action on ferment activity.

To determine the diffusibility a simple apparatus consisting of two tubes connected below by rubber tubing was used. In one tube a 10 per cent solution of egg-white was placed, in the other the antiseptic. The time taken by the antiseptic to reach the top of the other tube was then recorded with a 2.5 per cent solution. Phenol reached the top in 18 hours, quinine hydrochloride 15 hours, chinolol 7 hours, ammonium fluoride 11.5 hours, sodium fluoride 12 hours, quinine hydrofluoride 9 hours, tincture of iodine none found after 7

days, mercuric chloride saturated solution 48 hours, acetic acid 12 hours, sodium carbonate 32 hours.

By this it is seen that chinolol was the most diffusible, and tincture of iodine the least.

In determining the chemotactic action Wright's technique was employed. Two methods were used: (1) superposition of solution on clotted blood; (2) superposition on unclotted blood.

The chemical substances were divided into three groups: (1) those that attract leucocytes, (2) those that repel them, (3) those having no distinct action.

1. Thymol and potassium iodide were most positive. Salicylic acid and low concentrations of sodium bicarbonate have a much less marked effect.

2. Dakin's solution, phenol, sodium fluoride, and fairly strong solutions of acetic acid are negative, while quinine and weak acetic acid were less pronounced.

3. Chinolol, physiological saline, camphor, strong solutions of sodium bicarbonate, have slight influence on leucocytes.

The action of antiseptics on ferment activity was studied for the reason that the destructive action of many bacteria is believed to be due to bacterial ferments, and also the sloughing of a necrotic mass in a wound is probably brought about by autogenous ferments set free after death of the tissue.

Trypsin was employed for the experiments, because of its convenience and close analogy with the autolytic ferments. The amount of digestion was tested.

It was found that practically all the antiseptics decreased the amount of digestion. With quinine hydrochloride of a 0.27 per cent concentration there was no digestion. With phenol 2.16 per cent, chinolol 1.10 per cent, AgNO₃ 0.14 per cent, and mercuric chloride 0.27 per cent, there was no digestion.

The author concludes that antiferment chemical substances fall into two groups: (1) protein precipitants; (2) true antiferments. Those in group one inhibit ferment activity in three ways: (1) by removal of the ferment by precipitation; (2) by a direct antiferment action; (3) by combining with the substrate.

Quinine and chinolol are assumed to have a specific action as they are not protein precipitants.

HENRY J. VAN DEN BERG.

Beattie, J. M., Lewis, F. C., and Gee, G. W.: Hypochlorous Solution Electrically Produced from Hypertonic Saline as a Disinfectant for Septic Wounds, and for the Throat in Diphtheria, Scarlet Fever, etc. *Brit. M. J.*, 1917, i, 256.

This paper is the result of experiments carried out by Lewis in 1911-12 on the purification of water by the passage of an electric current after the introduction into the water of varying proportions of salt. Reports are given of cases in which the solution has been tried out; the comparative efficiency of the fluid is demonstrated by tables, and the apparatus is described in detail.

Among the authors' conclusions are the following:

1. The bactericidal action of this hypochlorous solution is high, and it has the advantage over the ordinarily used antiseptics in that it does not coagulate albuminous material, and thus form a protecting coagulum.

2. It has a slight stimulant action but is non-irritating.

3. The lymph flow in the wound is encouraged by the hypertonic solution which is used for the production of the hypochlorite.

4. Surface bacteria on septic foci seem to be destroyed almost immediately, and the stimulant action on the lymph flow tends to wash to the surface the more deeply situated organisms. This lymph increase is very evident in the wounds treated with this solution.

5. The solution can be produced very simply, and at comparatively small cost.

P. G. SKILLERN, JR.

Anderson, L. G., and Chambers, H.: The Treatment of Septic Wounds with Bismuth-Iodoform-Paraffin Paste. *Lancet*, Lond., 1917, cxcii, 331.

The ideal method of combating bacterial infection of wounds is to maintain continuous inhibition of bacterial growth in the wound with the least possible disturbance of the tissues and the patient. Hearing of the excellent results obtained by Morison from the use of a paste composed of bismuth subnitrate, iodoform, and liquid paraffin, the authors tried this paste extensively in their wards, and they have records of over 400 cases so treated. They state that these results are incomparably better than those of the previous year, when they were using eusol, hypertonic saline, with continuous irrigation or frequent dressings.

The composition of the paste is as follows: iodoform 2 ounces, bismuth subnitrate 1 ounce, and liquid paraffin q. s. It can be made of any consistency, but the most useful is that of soft butter and thick cream. They followed the method of treatment recommended by Morison: the patient is put under an anæsthetic, all gangrenous and necrosed tissue is cut away, and the wound thoroughly cleansed; it is swabbed out with rectified spirit, and then a small portion of the paste is vigorously rubbed into the tissues, a little being left in the bottom of the wound, which in many cases is closed with interrupted stitches, and dressed with gauze wrung out in spirit. No further dressing is required for seven to fourteen days. The work in a surgical ward is much reduced when patients do not require daily dressings, and it is a great advantage to the cases if the painful and disturbing manipulation can be avoided.

Observation shows that (1) the paste maintains a continuous antiseptic action in the wound; (2) it acts as a lymphagogue, and a free exudation of serum washes the wound from within outward; (3) it does not prevent the escape of discharge; (4) granulation tissue grows freely in contact with it;

(5) drainage tubes and gauze drains are unnecessary; (6) septic wounds heal nearly as rapidly as non-infected ones; (7) bone union is rapid and the tendency to form sequestra is slight.

Both constituents of the paste are toxic if absorbed freely. Only one case of such absorption has occurred. Acting on the recent advice of Morison, the quantity of paste now used rarely exceeds 2 drams; with this amount the risk of toxic absorption is negligible.

To decide the progress of the case the data given are: (1) the duration of the febrile period; (2) the length of time before healing; (3) for cases complicated with bone injury, the persistence of sinuses and the formation of sequestra.

In conclusion, the authors state that the principles which underlie this method of treatment and that of Carrel and Dakin may be compared. In the latter a very powerful antiseptic agent of high solubility is employed, but the effect is so transitory that it is necessary to renew it at short intervals. Morison employs a less powerful antiseptic and one which is of feeble solubility, but which is able to keep up a continuous action in the depths of the wound without requiring renewal for days or even weeks.

The improvement in the authors' results with this treatment encourages them to believe that it is along this line that progress will be made in future.

P. G. SKILLERN, JR.

Distaso, A., and Bowen, T. R.: Autodisinfection of Wounds by the Use of Ether Solution. *Brit. M. J.*, 1917, i, 259.

The authors' aim has been to create, by "quickening" the process of regeneration, embryonic tissues in wounds. With this end in view, ether was selected on account of its marked stimulating power.

Eleven cases are cited which were irrigated with a 2 per cent ether solution in lukewarm tap-water, using about two liters once daily. The apparatus used was similar to Lane's apparatus for subcutaneous infusion. The following case may be taken as an example.

A case of compound fracture of the tibia and fibula with marked sepsis and poor drainage, was treated with ether irrigation, and in six days granulation tissue was abundant in a large cavity in at least one-third of the leg. The large size of the firm granulations was well demonstrated in this wound. Pus was not visible after nine-days' irrigation, and the surface oozed blood freely.

In order to acquaint themselves with the process of healing in these wounds, sections of the granulations grown during the treatment were made, demonstrating that regeneration of the tissues takes place normally. It is, however, to be noted that the number of polymorphs present was very small, but lymphocytes were present in fair numbers. The most striking feature was the marked production of fibroblasts. The new blood-vessels were very richly distributed, and quickly formed in the deep

layers. The upper layers showed fibroblasts which were in the stage of forming vessels. On staining the sections by Gram's method and fuchsin no microbes of any kind were to be seen. The total absence of fibrin (Weigert-Gram method) was another striking feature in the sections.

The above observations prove, in the authors' opinion, that the leucocyte defensive property is not to be taken into consideration, the facts which emerge clearly from a study of the sections being the great vascularization of the regenerated tissues and the marked abundance of the contained blood corpuscles, together with the presence of an enormous quantity of fresh young fibroblasts and the entire absence of fibrin.

In one case the induction of bleeding by scarification of the wound surface immediately resulted in a quicker and firmer growth of new tissue. Indeed, without undervaluing the bactericidal power of young, fresh tissue, the bactericidal action of the blood in these cases must also be considered, the function of ether being to stimulate the growth of the tissues without clotting the fibrin, and thus providing the newly formed tissue with free and constant lavage with blood. This the authors consider a logical conclusion from the foregoing observations, despite its conflict with current opinion in this matter.

The ether method has given definite curative results where other methods have been disappointing. It has also proved its ability to quicken the healing of wounds to a striking degree, and the treatment of a case is now completed in about half the time taken before its introduction into their practice.

P. G. SKILLERN, JR.

ANÆSTHETIC

Konrad, F. C. W.: Paravertebral Anæsthesia. *Boston M. & S. J.*, 1917, clxxvi, 351.

In Kroenig's clinic at Freiburg, and in Boston, Konrad has administered paravertebral anæsthesia according to Sellheim and Braun in 50 operations, chiefly gynecological and obstetric. He follows Kroenig's technique.

Additional ether was used in five cases, in four of which the amount required was very small; the other one was a complete failure. In cœliotomies the patient was found to evince pain if organs and tissues were pulled upon so as to affect areas beyond the field of anæsthetization, as in packing back the intestines with gauze.

In major operations Konrad gives 10 grains of veronal the preceding evening, and in the morning 0.0003 gram scopolamine and 0.03 gram narcophin together two and one-quarter and one and one-half hours before operation. Occasionally it may be necessary to give one-half the above dose immediately before beginning the paravertebral injections and again during the operation if it is desirable to keep the patient asleep. He follows Kroenig's ideas as to dosage of novocaine, but in one case gave as much

as 620 ccm. of a 0.5 per cent solution, or 3.1 grams, without untoward effect.

Konrad's experience has been satisfying. He believes the method possesses unqualified advantages over spinal or sacral anæsthesia, without their dangers and uncertainties. In comparison with inhalation anæsthesia the patient's energies are spared by the elimination of shock, and his convalescence hastened by the ability to take and retain food immediately after operation.

ALBERT EHRENFRIED.

SURGICAL INSTRUMENTS AND APPARATUS

Bettman, R. B.: A Simple Operating Fluoroscope for Aid in Removal of Metal Bodies. *J. Am. M. Ass.*, 1917, lxxviii, 908.

This inexpensive apparatus, which is simply a light fluoroscope or cryptoscope, can be strapped to the head of the operator. It is in the form of a hollow truncated pyramid, with a base consisting of a fluorescent screen, 13 by 18 cm., the four sides of thin wood, cardboard, or papier maché, about 13 cm. high, and the top left open and so shaped that it fits over the eyes of the surgeon.

The fluorescent screen is on hinges, and under the influence of a small steel spring it flaps open, allowing the operator to see. When the screen is pulled down, it is held in place with a catch and the surgeon is looking into a light-tight box, the floor of which is converted into a fluoroscope as the roentgen rays strike it. Pressing on a button releases the screen.

The edges fitting over the face of the operator are rimmed with black fur or plush, as are also the edges of the screen, so as to make the whole apparatus light tight.

It has been found that operations with the aid of the operating cryptoscope — the name given the apparatus in Vienna — are performed much more easily and quickly than with any other method of localizing the bullet, that a much smaller incision can be made when a small incision is desired, and that the tissues are not so apt to be injured as when the surgeon has to search for a small encapsulated body.

EDWARD L. CORNELL.

Page, C. M.: An Appliance for the Ambulatory Treatment of Fractures of the Thigh. *Brit. M. J.*, 1917, i, 292.

The importance and value of the ambulatory treatment of fractures of the femur at the earliest period practicable is well recognized. The restoration of full function of the limb, the union of the bone, and the repair of any wounds present are all favorably influenced by such treatment. Hardly less important is the improvement in the morale of the patient which occurs once he is able to move about again independently. The apparatus which the author describes and illustrates is easily made by the surgeon from inexpensive and readily available material. Its chief advantage over the caliper type of splint is that at a certain period it leaves the

knee-joint free. The author has chiefly used the apparatus for gunshot and other compound fractures, and has found it well adapted to fractures in the middle third of the femur. As to the time of application, the apparatus can be used in simple fractures as early as the eighth day; while in gunshot fractures it is most satisfactory when applied six to twelve weeks after the injury. The rapidity

with which men will walk in this appliance without the aid of crutches or stick depends to a remarkable degree on individual mentality. In general it is wiser not to hurry a man to forsake his crutches. So long as he is taking a fair amount of weight on the injured limb, and moving both the ankle and knee-joints, its function will rapidly improve.

P. G. SKILLERN, JR.

SURGERY OF THE HEAD AND NECK

HEAD

Esser, J. F.: Studies in Plastic Surgery of the Face. *Ann. Surg.*, Phila., 1917, lxxv, 297.

The author has had extensive experience with plastics of the face and mouth in war hospitals and has obtained gratifying results in many cases by a special technique which he describes chiefly by means of illustrations. He has developed a new technique in the application of Thiersch grafts, which consists of making an exact impression with dental wax previous to the operation which secures a firm contact of the graft with its bed and is kept in place until the graft is taken. The lifting of the graft under special aseptic technique and with care to obtain an even thickness is of great importance. He found the skin on the inner side of the upper arm to be the most satisfactory, being thin and elastic.

Owing to faults in translation the author's technique for securing grafts is not clear. His use, however, of a wax impression to insure a smooth line of the graft in concave surfaces seems to be an advance in the technique of skin-grafting.

HORACE BINNEY.

Cavina, C.: Forced and Permanent Occlusion of the Jaw as a Method of Treatment in Maxillary Fractures (L'occlusione forzata e permanente delle mascelle ame methodo di cura delle fratture della mandibola). *Stomatol.*, Milano, 1916, xiv, No. 6.

In the service for the treatment of wounds of the jaw directed by Beretta in the military hospital at Bologna a method of treatment has been adopted which consists in forced occlusion of the jaws by means of metal ligatures. Cavina states that this is well borne by the patients and that not a single case of muscular or articular constriction has occurred even in patients who have had their jaws immobilized for two or three months; but to avoid any such complication the appliance is removed from time to time for several hours. Cleanliness is maintained by means of antiseptic irrigations and the use of the toothbrush. The method is employed in simple fractures with displacement of fragments; as comminutive fractures; in fractures with loss of substance; in cases of bony or carti-

laginous grafts. In simple fractures immobilization is to be practiced immediately; in open fractures and in cases with loss of substance it is necessary to await disappearance of suppurative and necrotic processes.

The apparatus used consists of two cast metallic gutters with small buttons soldered in the vestibular side, these being placed in a vertical line with each other or alternating according as it is desired to make separate ligatures or a continuous ligature with a single metallic thread. The gutters are cemented to the teeth under local or general anaesthesia if the reduction of the fragments is painful. If the two jaws cannot be brought together at once, it is necessary to proceed, gradually tightening the wires more every day. The patient can take liquid food through the retromolar space, or through space remaining after loss of teeth. When consolidation of the fragments is obtained the ligatures are removed, leaving the gutters in place some days longer.

W. A. BRENNAN.

McWilliams, C. A.: The Treatment of Bony Defects of the Lower Jaw. *Ann. Surg.*, Phila., 1917, lxxv, 283.

Poor results in the past in the treatment of osteomyelitis of the lower jaw, due largely to too long delay on the part of the dentist in removing abscessed teeth or in establishing free drainage of alveolar abscesses, led to more or less widespread necrosis of the jaw, and to too vigorous use by the general surgeon of the curette and chisel.

The author believes that every "gum boil" should be treated by extraction of the tooth and free incision along the alveolar process. When chronic osteomyelitis has developed, the treatment should be expectant until the sequestrum has been loosened, then the dead bone should be removed, with the greatest care not to injure the living bone or periosteum. When a defect has formed, in order to preserve the proper alignment of the teeth, the upper and lower teeth should be wired together or some retentive apparatus used. If the periosteum has been preserved it is possible that new bone will fill in a small defect. When a large defect is present, in order to preserve tooth alignment, so that chewing is possible, a bone or cartilage graft is necessary.

The operation cannot be performed until the area is entirely free from infection and all sinuses healed. When this stage is reached, the patient must be fitted with Angle's fracture bands. The operation of inserting the graft must be performed with the greatest care with regard to asepsis. Lane's fracture technique must be followed. Grafts are usually taken from the tibia, but if cartilage, the costal cartilage is excised. The defect must be prepared for the graft with the minimum of injury to the periosteum and if an opening is made into the mouth, the attempt must be abandoned as infection will always destroy the graft. Late infection, however, may only be followed by partial necrosis.

The author does not agree with Albee that bone-graft is at all resistant to infection. He recommends following the suggestion of Morestin in the use of cartilage instead of bone, as cartilage is more resistant to infection. The graft is usually secured in place by kangaroo tendon sutures. Absolute immobility of the lower jaw should be maintained for three or four months. If infection results the first time the operation should be repeated when the infection has subsided. The minute details of the operation and after-care are given and the great importance of patience and thorough co-operation on the part of the patient emphasized.

The author reports six cases of bone-grafting which indicate the value and efficacy of his method of treatment.

HORACE BINNEY.

Aller, T. G.: Operative Treatment of Prognathism.
Dental Cosmos, 1917, lix, 394.

The etiology of prognathism is somewhat obscure, according to Aller. He believes that relaxation of the tendons and ligaments of the temporomandibular articulation is the best explanation. Other theories are atavism, inattention to the teeth during the period of eruption (Brophy), sliding forward of the body of the mandible as a whole and enlargement of the tongue (Blair). The author reports a case of an 18-year-old girl with a marked protrusion of the jaw, open bite, on the one side only the second molar occluding, on the other the first and second. Impressions were taken and casts of the jaws made. Out of the cast of the lower jaw a triangular section was cut on each side, and the second bicuspid whose occlusal surfaces formed the base of the triangle were removed. The segments were then waxed together and German silver splints made. At operation the second bicuspid on each side were extracted and the V-shaped sectors cut out intraorally with chisel and mallet. Parts were approximated and splints adjusted. Difficulty in cementing these splints forced the author later to wire the upper teeth to the lower. The teeth adjacent to the incision were not used. The patient made an uneventful recovery, and judging from photographs before and after, the procedure was very successful. The enlargement of the tongue and lip disappeared.

A brief description is given of various other methods of operating for prognathism, the author claiming the following advantages for his operation: no scar is left; the body of the mandible is shortened; anterior occlusion can be obtained; the periosteum is not lifted, and the best approximation of sections is obtained.

To S. P. Hullihen of Wheeling, W. Va., for his work done in 1850, the author gives the credit of being the pioneer in this field.

RALPH BOERNE BETTMAN.

Vegas, M. H., and Jorge, J. M.: Anterior Cephalocele
(Cefalocele anteriores). *Rev. Asoc. méd. argent.*, 1917, xxvi, 5.

In the pediatric department of the National Hospital of Buenos Aires the authors in 22,600 registered cases have observed only 3 cases of anterior cephalocele. The tumors were successfully removed in two cases; the third was not operated upon. None of the tumors showed malignancy.

The authors give a short historical review of the literature concerning these tumors. Anterior cephalocele vary in size but are usually smaller than the posterior variety. The usual situations are in the glabellar region in the root of the nostril or in the internal angle of the eye. In some cases the tumor is in the sphenoidal fissure or in the ethmoid region simulating a nasopharyngeal polyp. In consistency the tumors are soft and irreducible, contrasting with encephaloceles of other regions in which reducibility is accompanied by nervous and other alterations. Differing from the views of other observers the authors think that these tumors show at times an expansion related to cardiac and respiratory movements.

The tumors are usually solid and painless. They may be mistaken for dermoid cysts, fibroma, certain angiomas and lymphangiomas; but in these the consistency, somatic character, base of implantation, etc., give data to establish a differential diagnosis.

The only rational treatment is extirpation and occlusion of the orifice. Operation consists in making an oval or fusiform incision, dissecting the tumor to its base, ligaturing the pedicle, sectioning the tumor from it, and occluding the orifice by periosteal or osteoperiosteal plastic procedure.

In the cases operated upon by the authors the communicating orifices were very large making necessary a free bone-graft plastic operation to obviate reproduction of the tumor.

W. A. BRENNAN.

Segura, E. V.: Contribution to the Surgery of the Hypophysis (Contribucion á la cirugía de la hipófisis). *Semana méd.*, 1917, xxiv, 85.

The author gives detailed histories of five cases of hypophyseal tumors operated upon with highly favorable results. In all these five cases Segura followed the septal method of Hirsch in which he has introduced some slight modifications. First, poste-

rior separation of one of the mucous sheaths is done in order to make the sella turcica accessible, through one of the nasal fossæ. As it is exceptional to find nasal fossæ that are sufficiently ample to permit the operation to be carried out fully, it is almost always necessary to resect the free edge of the inferior turbinates or even all of at least one of the middle turbinates in order to be able to give a sufficient degree of separation to the two mucous sheaths of the septum and to permit perfect control of the operative field without the necessity of forced dilatation as in Cushing's operation. This resection is done about eight or ten days prior to the hypophyseal operation.

A second important modification made by the author in Hirsch's method consists in making a tamponade after the operation as a consequence of the new condition of the two mucous sheaths of the septum. In Hirsch's procedure he places a strip of iodoform gauze between the two mucous sheaths after operation to provide drainage for the wound secretions. Segura is of the opinion that this strip of gauze should not be placed merely as a simple drain, but as a tampon; since, because of the action of adrenalin, there is no loss of blood from the mucous surface, but the formation of a coagulum or hæmatoma may prevent drainage instead of promoting it.

For this and other reasons the author has practiced in all his cases as the last part of his intervention, for the purpose of keeping the operative cavity accessible, the total separation of the right septal mucosa sheath at its posterior insertion. The right mucous membrane being made movable is pushed toward the left, giving ample access through the right nasal fossa to the widened sphenoidal sinus as well as to the cavity of the sella turcica.

By this method the author has been able in all his operated cases to keep the full operative field perfectly accessible, which has unquestionable advantage after operation. Comparing his 5 cases with no deaths with previous statistics, the author shows that Hirsch's and Cushing's operative mortality was 13.6 per cent and 13.7 per cent, respectively. Previous attempts at this operation showed a mortality of 34 to 41 per cent. The operation now, owing to the perfection of the technique, has the least mortality of any operation in the cranial cavity.

W. A. BRENNAN.

NECK

Remond and Minvielle: The Antitoxic Action of the Thyroid in Uræmia (Du rôle antitoxique de la thyroïde dans l'urémie). *Bull. Acad. de méd.*, Par., 1917, lxxvii, 334.

From a series of animal experiments the authors deduce that the thyroid has a clearly antitoxic action and that uræmic intoxication is notably aggravated by the diminution or suppression of the thyroid function.

W. A. BRENNAN.

O'Day, J. C.: Intrathyroid Injections of Boiling Water in Hyperthyroidism. *Ann. Surg.*, Phila., 1917, lxx, 279.

O'Day has used the boiling water injections of Porter in seventeen cases of goiter and reports that all patients have been benefited by the treatment. His first experience with the method was in 1913, when he treated four patients, who at this time are free from symptoms.

Increasing experience emphasizes the necessity of skill on the part of the operator if he is to succeed with the injection method. The author prefers giving a hypodermic of morphine, and when the effect of this is manifest, injecting the boiling water without the knowledge of the patient. In carrying out the "cooking" process, a definite plan of attack should be borne in mind. The first infiltration should be made at the upper pole, and each succeeding injection carried downward, so that the destruction of gland is wrought in strata; unless some such order is maintained, one may unconsciously reinject a portion that has already been treated, thus delaying the improvement of the patient. When the gland is small, making the injection uncertain, good results can be obtained by exposing the thyroid, using local anæsthesia, and making the injection directly into the goiter. With the gland exposed in this way the effectiveness of the process can be appreciated. As the boiling water is being injected, the corresponding portion of the gland is seen to whiten into a bloodless, pulp-like mass.

L. F. WATSON.

Hess, J. H., and Strauss, A. A.: Autotransplantation and Homotransplantation of the Thyroid Gland, Using the Capsule as the Seat of Transplantation *Arch. Int. Med.*, 1917, xix, 518.

The authors, having under their care a large number of cretins in whom cessation of the thyroid feeding led rapidly to a recurrence of myxœdema with its train of symptoms, were led to undertake the following experimental work on autotransplantation and homotransplantation of the thyroid gland in the hope of obtaining sufficient positive results to warrant clinical operative interference. The following experimental operations they present as a preliminary report.

They found that the autotransplants of the thyroid gland into the thyroid capsule were successful in all their cases, corroborating the work of other investigators in autotransplantation. They studied three such cases of multiple autotransplantation.

The homotransplantation of the thyroid gland in animals is of great importance, the authors state, and yet it has been unsuccessful up to the present time. Success in this form of transplant work, they believe, would be a great step in solving the question of homotransplantation in general.

They note that it has been the tendency of nearly all workers to transplant the thyroid gland into some other portion of the body than into its normal location. Considering the highly specialized function

of the organs of internal secretion it seemed to the authors that the normal location was the best for definite functional reasons and therefore it seemed logical to them that they should attempt to transplant the organ so far as possible at the seat of its normal blood supply.

They believe that some of the important factors involved in a consideration of the normal position of this organ are as follows:

1. The relation of the blood-pressure and the size of the blood-vessels nourishing this highly specialized organ must have an important bearing on the osmotic pressure of the blood and lymph as well as on the cellular structure of this particular organ, and consequently on its physiology.

2. It would appear that the chemistry of the tissue surrounding the thyroid transplant in intracapsular transplantation should be more adapted to its growth than would be the chemical reaction in foreign surroundings.

3. The secretion and iodine content of the remnants of the thyroid fragments within the capsule may be a factor in the retardation of the reaction between host and transplant in a manner similar to the results as shown by others in iodine feeding of the host before the transplantation.

The authors attempted to do all their transplant work without cutting off any portion of the blood supply to the gland. This was accomplished by placing their transplants into the thyroid capsule without ligation of any of the vessels supplying the thyroid gland. They accomplished this by splitting the thyroid capsule and removing part, or in some cases practically all of the thyroid tissue.

From their experiments the authors believe that the transplantation of autotransplants and homotransplants of highly specialized organs into the region normally occupied by these tissues is worthy of further trial.

They think there should be a minimum disturbance of the blood supply in the region in which the transplant is placed, and that foreign bodies, such as suture material, should not come into contact with the transplant.

The varying degree to which a homotransplant takes depends, the authors found, on the amount of reaction between the host and the tissue transplanted, and so far as they could perceive there were no means either in the blood or in the thyroid gland itself by which they could determine the factor which produced this different condition in the various animals.

A familial relationship and probably the early age of the animals on which operation was performed they considered important factors in their results.

GEORGE E. BEILBY.

Reede, E. H.: The New Status of Exophthalmic Goiter. *Med. Rec.*, 1917, xci, 450.

Reede believes that sufficient intensive work has been done by competent investigators in the last two years to enable a correlator to say with a high

degree of certainty that it is demonstrated that exophthalmic goiter is not a pure expression of thyroid activity, but that it represents the conjoined result of excessive function of the thyroid, the suprarenal glands, and the cervical sympathetic nervous system.

He gives the credit for differentiating exophthalmic goiter from toxic hyperthyroidism to Wilson of the Mayo Laboratories, who first showed in thyreotoxicosis with exophthalmos the picture of a primary hypertrophy and hyperplasia of epithelium which is pathognomonic of this type in contrast to the varied group of toxic hyperthyroidisms including the pseudo-exophthalmics which show primary retention of colloid with epithelial atrophy, the encapsulated adenomata, and the carcinomata.

Plummer, working from the clinical side, corroborated the work of Wilson and demonstrated that the confusion which existed then in the Mayo statistics and is still vitiating the statistics of many reporters at the present time was due to attributing the tremor, tachycardia, etc., of neurasthenia, cardiovascular disease, and nephritis to the thyroid, and especially in accepting a Stellwag's sign with naturally prominent eyes associated with a toxic goiter, as a true exophthalmos. Plummer says that if exophthalmos is ever associated with a non-hyperplastic toxic goiter it is so rare that it must be considered accidental.

The continuity of events leading up to exophthalmic goiter the author briefly outlines as follows:

A period of infection leading up to hyperplasia of the thyroid and a goiter with or without symptoms and beginning often in childhood.

A period of increased physiological demand inducing hyperthyroidism.

The stage of rapid metabolism and highly sensitized bodily function known as hyperthyroidism.

The period of emotional stress in which originate the stimuli to suprarenal secretion.

The stage of suprarenal oversecretion with the appearance of general sympatheticotonic symptoms and the localization of the brunt of the effect on the cervical sympathetic.

The stage of degeneration and the breaking down of the cardiac, mental, visual, nervous, thyroid, and suprarenal mechanisms.

In conclusion the author states that his inferences are tentative and the observation of other workers in this field are needed to determine their acceptability as a working standard. Accepting them at the moment, however, for the purposes of argument, certain natural deductions suggested themselves to him.

In the first place he feels strongly that some definite attempt should be made to protect the thyroids of girls from five years up against the bacterial injury from mouth and nearby infections.

In the second place, he believes that a child with a hypertrophic thyroid or goiter faces the possibility of developing hyperthyroidism under such metabolic strain as that of puberty, and urges that that

physiological stress be lightened by careful supervision.

Thirdly, that a young woman with a goiter and hyperthyroidism runs a certain danger of developing toxic hyperthyroidism or exophthalmic goiter, and a determined endeavor should be made by psychotherapy and physical and mental rest to bring the metabolism down to normal. Environmental neutrality and insulation against psychic trauma should be assured if possible.

Fourthly, if the hyperthyroidism develops in the direction of sympathicotonia, the presumption of impending exophthalmic goiter is so strong, the author believes, that grave consideration is warranted.

Fifthly, if operation is determined upon in ex-

ophthalmic goiter he believes it should be done at the earliest moment and should be bilateral and adequate.

Sixthly, it must be accepted, he states, that operation after the first year of active exophthalmic goiter must not be expected to remedy symptoms which arise from other organs than the one removed at operation.

In the seventh place, after the fourth year the thyroid is usually exhausted and undersecreting, the author found, which he states may be true of the adrenals as well, and careful observation is merited by symptoms which may in no direct way be arising from thyroid secretion.

GEORGE E. BEILBY.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Pauchet, V.: Wounds of the Chest (Plaies de poitrine). *Presse méd.*, 1917, p. 233.

Pauchet says that 30 per cent of the men with chest wounds die at the first-aid station from asphyxia or hæmorrhage, 20 per cent die in the ambulance, and a few later at the interior hospitals. If those that die on the field are added it can be said that the majority of chest wounds are fatal.

In the treatment of chest wounds a discrimination must be made between immediate and late treatment. The immediate treatment is concerned with the recovery of the general state by combating shock, hæmorrhage, or infection. Open thoracic wounds have a grave prognosis and often call for immediate intervention. Closed thoracic wounds should be treated by rest and should be watched carefully; their prognosis is more favorable. In an open wound the soft parts must be surgically cleansed, costal resection done if a rib is broken, the pleura disinfected, the pulmonary lesion located, and the projectile found which should be removed to stop hæmorrhage. In a closed wound abstention is almost generally the rule; to puncture if there is hæmothorax and to follow this if necessary by artificial pneumothorax which assures collapse of the lung and prevents continuance of hæmorrhage. Hæmostatic thoracotomy is only exceptionally indicated.

The after-treatment consists in keeping up the strength of the patient, pulmonary gymnastics, to look out for signs of suppuration, to pleurotomize if there is a shut-off purulent pleurisy and incise where the collection is. If there is a pyopneumothorax of the large cavity, the incision should be at the thoracic base. The operator should always be guided by the X-rays. Paravertebral anaesthesia is the choice in pulmonary surgery.

W. A. BRENNAN.

Lilienthal, H.: Empyema of the Thorax. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

Lilienthal presents the statistics of operative methods looking toward the more rational treatment of empyema. The main principle of his contention is that in addition to evacuating the pus from the thoracic cavity the mortality rate should be lowered and the final result should show a conservation of lung capacity with symmetry of the chest. He believes that this can be accomplished by what he terms major intercostal thoracotomy, with lung mobilization. In very critical cases major thoracotomy is preceded by minor intercostal thoracotomy and tube drainage without rib resection. About one-third of the cases recover after minor thoracotomy and do not require the major operation. Postoperative roentgenography is valuable in determining which cases require further surgery.

Encapsulated empyema of moderate size may often be treated by resecting one or more ribs with their periosteum, over the collection of pus, the cavity being packed and treated as an abscess.

Lilienthal reports on one hundred consecutive unselected cases in children and adults, the empyema resulting from various causes, such as pneumonia, liver abscess, septic embolism, etc., and there were twenty-three deaths. There were three cases of double empyema with one death. The reduction in mortality over that of the previous ten years was 5 per cent. The most important advance, however, is indicated by the total absence of chest-collapsing thoracoplasties in the entire list of one hundred cases during a period of three years.

Hendricks, C. M.: Artificial Pneumothorax; a Plea for Partial Compression. *South. M. J.*, 1917, x, 107.

The author gives the advantages and disadvantages of both complete and partial pneumothorax.

This procedure is used not only in tuberculosis of the lungs but is being applied in other branches of pulmonary surgery. Duval of France uses it in extracting foreign bodies, such as projectiles, and Ebert of Germany employs it in all traumatic conditions of the lungs.

Heretofore it has been the aim of all operators to obtain complete collapse over a period of months. This has been demonstrated by Forlanini, Sangman, Kistler, and others to produce an excessive overproduction of fibrous tissue throughout the compressed lung, thus rendering further use impossible. Also complete collapse is usually followed by pleural effusion, which in turn is followed in not a few instances by considerable deformity and later by acute activity in the opposite lung. The advantages of this method, however, is not only the mobilizing of the lung but the arrest of the lymph flow from it which prevents the absorption of any amount of toxic material.

In partial collapse the disadvantages are: (1) Refills are more frequent. (2) Patients must be studied by examination and fluoroscope more closely to determine when to refill. (3) Greater care is demanded in making refills to prevent infection, air embolism, and pleural shock.

The advantages are: (1) The results are the same clinically. (2) Partial collapse may be used alternately in either lung or at the same time in both lungs, if the case so demands. (3) There is less tendency to pleural effusions. (4) There is very little strain thrown upon the right heart. (5) There is no disturbance of the mediastinum. (6) There is less danger of spontaneous pneumothorax. (7) There is less danger of rupturing an

abscess into the pleural cavity. (8) When the disease is arrested we have the unaffected portion of the lung performing its function. P. M. CHASE.

TRACHEA AND LUNGS

Aranda, F.: Suture of the Lung and Heart (Sutura de pulmon y corazón). *Rev. de med. y cirug. pract.*, Madrid., 1917, xli, 141.

Aranda relates the case of a child who was brought to the hospital in a sinking condition due to a stab wound in the left thoracic region. There was abundant hæmorrhage, hæmopericardium, and weak cardiac contractions. An intercostal incision was made by extending the traumatic wound; a further vertical incision was made resulting in a cruciform opening through the initial lesion. About 4 cm. of the fifth rib was resected, providing sufficient space to work in. The index-finger was introduced, the pericardium cut with scissors; the cavity was found to be virtually normal although much dilated by a large quantity of coagulated blood which was evacuated. A wound was found in the myocardium about 3 cm. long located in the left ventricle, in the site of union of the ventricular partition and left auricle, slightly involving the cardiac fibers. There was also a wound in the border of the left lung. Aranda sutured both wounds with silk. There was immediate cessation of hæmorrhage and of the collapsed condition with a strengthening of the cardiac contractions. The opening was closed, leaving a drain. After 8 days the patient was able to sit up and had completely recovered 30 days after the injury. W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Rouvillois, H., Pedepade, Guillaume-Louis, and Basset: New Series of Abdominal Wounds Treated in Automobile Surgical Ambulance No. 2 (Nouvelle série de plaies de l'abdomen, traitées à l'ambulance chirurgicale automobile No. 2). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 705.

The authors' ambulance was stationed about 15 kilometers from the first line of trenches and since their previous report, March, 1916, they have observed 503 abdominal wounds. These are divided into: (1) extraperitoneal wounds—parietal, visceral; (2) peritoneal wounds—simple, visceral; (a) univisceral, (b) multivisceral.

1. There were 150 extraperitoneal wounds, 126 being parietal and 24 visceral. The 24 visceral wounds included 14 kidney lesions (13 recoveries and 1 death) and 10 wounds of the bladder, rectum, and colon, with 5 deaths.

2. Of 12 simple peritoneal wounds without visceral lesion, 3 recovered and 9 died. Of the visceral peritoneal wounds 120 gave indications for laparotomy. These are shown in the following table:

Univisceral Wounds	Cases	Recoveries	Deaths	Mortality Per cent
Small intestine..	30	11	28	71.7
Cæcocolon.....	17	7	10	58.8
Liver.....	7	2	5	71.4
Stomach.....	6	4	2	33
Spleen.....	2	1	1	50
Bladder.....	1	1	..	....
Multivisceral Wounds				
Small intestine and cæcocolon	24	10	14	58.3
Small intestine and stomach..	3	1	2	66.3
Small intestine and bladder..	6	1	5	83.3
Colon and liver.	2	0	2	100
Liver and kidney	2	2	0	....
Spleen and kidney	3	1	2	66
Small intestine and liver.....	1	0	1	....

Cæcum and bladder.....	I	0	I	.....
Stomach and liver.....	I	0	I	.....
Colon and kidney.....	I	0	I	.....
Rectum and bladder.....	I	I	0	.....
Small intestine, rectum and bladder.....	I	0	I	.....
Colon, spleen, and kidney.....	I	0	I	.....
Liver, bladder, and rectum.....	I	0	I	.....

The relation of mortality to the time of operation is as follows:

	Cases	Deaths	Mortality Per cent
Operated in first 6 hours.....	33	19	57.5
Operated between 7 and 12 hours.....	57	36	63.1
Operated between 12 and 24 hours.....	19	16	84.2
Operated after 24 hours.....	2	2	100

The authors find that wounds of the lateral abdominal regions (hypochondriac and iliac fossa) are much less grave than those traversing the median line and the neighborhood of the umbilicus.

Multiplicity of perforations is a lesser factor of gravity than duration of the wounds. Some of the cases in which there were from 6 to 10 perforations recovered owing to very early intervention.

The first series of cases reported by the authors (March, 1916) showed a mortality of 75 per cent for univisceral and 90.5 per cent for multivisceral wounds. In this second series the corresponding figures are 63.9 per cent and 66.6 per cent. The authors' experience has led them to abridge the period of drainage in cases that are operated upon early, but in late operated cases it must be prolonged and associated with recognized methods of dealing with peritonitis (Murphy irrigation, Fowler position).

The authors report 72 thoraco-abdominal wounds in a separate category.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Hernando, T., and Alday, T.: Clinical Value of the Determination of Pepsin in the Gastric Contents (Valor clínico de la determinación de la pepsina en el contenido gástrico). *Siglo méd.*, 1917, lxiv, 130.

These conclusions reached by the authors are based on a clinical investigation:

1. While the determination of acid sediment, etc., holds a primordial place in the analysis of gastric juice, investigation of the ferments (pepsin, etc.) is also of high value.

2. The methods of Mett and Fuld-Levison have been used for the determination of pepsin for exactness and for simplicity.

3. Pepsin is very rarely entirely absent in the gastric juice.

4. In non-cancerous anachlorhydria pepsin is always diminished, at times considerably.

5. In hypochlorhydria cases pepsin is always normal or increased.

6. In ulcer, and pyloric stenosis of ulcerous origin, an increase of pepsin is always found, because in such cases there is hypochlorhydria. Apart from its diagnostic value this is of interest for the pathogenesis of the ulcer hyperpepsia in cancer production.

7. In acute gastritis pepsin may be diminished and hydrochloric acid may be increased.

8. In chronic gastritis of catarrhal type pepsin is more often found diminished in quantity than in the other forms of hyperpeptic gastritis which is most frequently accompanied by ulcer.

W. A. BRENNAN.

Lajoie, J. M.: The Diagnosis of Gastroduodenal Lesions. *J. Lancel*, 1917, xxxvii, 191.

The author bases his discussion on his observations of 500 stomach examinations done at the Mayo Clinic. He considers a carefully taken and skillfully interpreted history as the most important single method of gastroduodenal diagnosis, but insists that this must be supplemented by clinical, roentgenological, and chemical studies.

In gastric and duodenal ulcers chronicity of attacks and remission of symptoms occur in the large majority of cases with freedom from symptoms between attacks, as a rule.

Abdominal pain is the leading symptom during attacks, and nausea is often present. Pain occurring regularly between meals, relieved by food, suggests a lesion of stomach or duodenum. Severe and colicky pain as well as pain immediately after eating, especially with vomiting, are probably outside of these organs. Constant pain, not influenced by taking food, may or may not be due to disease in the stomach.

Ulcers of the duodenum, pylorus, and pyloric end of the stomach produce the same symptoms and should be considered together in diagnosis. In general, the lower the ulcer the longer the time between ingestion of food and the onset of pain.

In duodenal ulcer the pain usually occurs with remarkable regularity from day to day one to three hours after eating; is relieved by food or liquid or by alkalies; is increased on exertion and relieved by lying down. High acidity is the rule. Acid regurgitation may be present, but vomiting is rare except in an advanced case with obstruction. Bleeding occurs in one-third of the cases. In gastric ulcer the pain is not so regular in appearance after eating, is often constant instead of intermittent, and is relieved by alkalies, by vomiting, but not by food. Pain begins earlier, one half to two hours after meals, and is often gone before the next meal. If there is bleeding hæmatemesis occurs and blood is found in the stool in 25 per cent of cases.

Cancer of the stomach should be suspected when gastric disturbance occurs after the age of 40. There are frequently no symptoms produced until the tumor has grown to considerable size. Symptoms when they appear are constant gastric

distress and pain worse two to four hours after food intake, not relieved by vomiting. Emaciation and anæmia are often marked. Hydrochloric acid is commonly absent and lactic present. If there is pyloric obstruction, yeast cells, sarcinæ and Boas-Oppler bacilli will be present. Coffee grounds vomitus is found if there is bleeding. The author is convinced that cancer of the stomach can be diagnosed earlier by roentgen ray than by any other means.

Four roentgenological terms can be used in gastro-duodenal work: (1) ulcer, (2) cancer, (3) a lesion, (4) indeterminate.

In a series of 94 patients with positive roentgenological findings duodenal ulcer was present in 62, gastric carcinoma in 20, and gastric ulcer in 12. Carcinoma of the duodenum is extremely rare.

Filling defects persisting under all conditions under the screen, constant in all plates and not influenced by antispasmodics, as belladonna, are basic signs of cancer, though they may occur in syphilis and benign tumors and adhesions. Apparent filling defects due to extrinsic tumor and spasm must be ruled out. Localized absence of peristalsis is corroborative evidence of a lesion. Six-hour residue with achylia plus alterations of gastric contour means obstruction of the pylorus by carcinoma or obstruction of the duodenum by adhesions.

In gastric ulcer the contributory or secondary signs are: (1) incisura, usually in the wall opposite the ulcer and constant under manipulation and antispasmodics; (2) spasmodic hour-glass which is an extreme incisura; (3) a diffuse spasm of the pylorus; (4) organic hour-glass following perforating or penetrating ulcers; (5) residue consisting of one-eighth or more of the meal.

A shallow mucous ulcer may show nothing but the secondary signs. A penetrating ulcer shows a crater or niche. A perforating ulcer shows an accessory pocket, outside of the stomach.

Duodenal ulcers occur in the first inch and a half of the duodenum in 90 per cent of cases. Deformity of the duodenal bulb, persisting under examination, is the direct sign of a lesion here. Hypertonus, hyperperistalsis, and hypermotility are strongly indicative of ulcer. Gastrosplasm of the hour-glass type is common with duodenal ulcer, though ulcers of the stomach and duodenum occur together in 15 per cent of cases. Ulcer of the duodenum is the most common cause of pyloric stenosis, with retention of barium meal in the stomach. Hyperperistalsis associated with gastric retention and a normal gastric outline is diagnostic of duodenal ulcer.

Too much faith should not be placed in a single roentgen examination; re-examination, with administration of an antispasmodic, is advised in case of doubt.

The author considers co-operation between the internist and roentgenologist the ideal arrangement for the most efficient diagnosis.

Matlack, J. A.: The Correlation of Clinical and Roentgen Data in the Diagnosis of Gastro-Intestinal Lesions. *Interst. M. J.*, 1917, xxiv, 78.

The author lays stress on the interdependence of the roentgenologist and clinician in making diagnoses of gastro-intestinal lesions. The former should confine himself to actual observations and leave the ultimate interpretation of findings to the clinician who can correlate them with the history, physical examination, and laboratory tests. The roentgen examination has certain advantages over other methods in that it is almost entirely objective and thus discounts inaccuracies dependent on lack of intelligence to properly describe symptoms, overdevelopment of imagination, and variable sensibility of patients to bodily discomfort.

In œsophageal lesions, the roentgen ray examination serves to confirm and amplify the information obtained otherwise. It shows the size, shape, and location of diverticula and may serve to differentiate between a malignant constriction and cardiospasm. In gastric disturbances it may show the cause to be intrinsic or extrinsic and replace much that otherwise would be merely conjectural and indefinite with accurate representations. In suspected malignancy of the stomach or colon it may obviate an exploratory operation by showing the absence of a lesion or its inoperability.

Deformity of the first portion of the duodenum usually signifies ulcer, but occasionally it is due to adhesions or other extraneous causes and the clinical aspects may be needed to clarify the situation. Definite filling defects of the stomach or colon commonly indicate cancer, but may be due to syphilis, pressure, spasm, or inflammatory conditions in which the clinical information is essential. The personal equation is an important factor in determining the relative reliance to be placed on interpretations by roentgenologists or clinicians, experience being the chief essential.

The author concludes that a correct diagnosis in gastro-intestinal lesions may best be reached either by the examiner being both a roentgenologist and clinician or by close and friendly co-operation between the two, each with a proper respect for the work of the others.

ADOLPH HARTUNG.

Bryan, W. A.: Gastric Cancer. *South. M. J.*, 1917, x, 230.

The author's problem has been to determine, if possible, in the absence of tumor and obstruction the earliest time to open the abdomen with some reasonable assurance of finding cancer.

At first gastric cancer is as localized as cancer in any other place. From this the growth spreads by unicentral (a localized mass of some size) or multicentral development (numerous new centers). It is in the latter case that the glands are early involved according to Hauser. Again, even while the original focus is of the scirrhous type and thus slow growing the metastases may be the exact opposite and grow with alarming rapidity. Like-

wise, a small innocent-looking primary tumor may produce fatal extensions.

Bryan believes that the positive signs of gastric cancer should no longer be considered diagnostic, but rather prognostic and unfavorable at that. Pain so usually present is rather misleading and should be considered as merely an incident in the development of the growth. The clinical and microscopical evidence is little more than a suspicion and should never be relied upon. Likewise, the X-ray sheds some light on the problem but usually helps least where it is needed the most.

Bryan concludes that in all fairness early accurate diagnosis of gastric cancer is well nigh impossible. He recommends, however, the same line of procedure as used in a similar situation, i.e., cancer of the breast. Early exploration is the one and only hope; this to be done after sufficient therapeutic measures have been tried by a skilled internist, and without too much delay.

P. M. CHASE.

Forman, J.: Lymphoblastoma of the Gastro-intestinal Tract; Lymphosarcoma of the Intestines. *Proctol. & Gastroenterol.*, 1917, xi, 6.

Any portion of the intestinal tract may be the seat of sarcoma. It would appear, however, that the order of frequency of the sites involved is ileum, cæcum, jejunum, appendix, transverse colon, sigmoid, duodenum, and descending colon.

This paper is based on the study of three specimens of lymphosarcoma in the museum of pathology at the Ohio State University: two of the ileum and one of the colon. Sarcoma of the intestines is no doubt much more frequent than the literature would indicate.

The three cases under consideration occurred in males. The frequency of sarcoma of the small intestine in the male compared with that of the female is, in the cases so far recorded, about 2 to 1. In the large intestine according to Jopson and White, the frequency of incidence is nearly equal in the two sexes.

According to Speese, the fourth, third, fifth, and second decades is the order of frequency of the ages afflicted with sarcoma of the small intestines. The ages of the patients with sarcomata of the ileum herewith reported were 19 and 23 years respectively. The sarcoma of the colon occurred in a patient aged 41. According to the reported cases the first decade has furnished the largest number of cases and the fourth decade stands next in the order of frequency for this site.

It is interesting to note that two of the three cases (one of sarcoma of the ileum and one from the colon) were syphilized, and this introduced a somewhat confusing factor into the clinical picture. As to whether syphilis bears an etiologic relationship to the development of sarcomata, there are all sorts of opinions from Schmidt, who remarks of sarcoma that luetic antecedents are not common, to von Eschmarch, who states that in his clinic more than one half of his sarcoma patients have been luetics.

The two specimens from the ileum, here reported, had involved less than one-half of the circumference of the wall. Being more or less localized they were the cause of intussusceptions. Kasemyer found in 284 cases of intussusception that a sarcoma had been the cause in 26 instances. Of the 74 cases of sarcoma of the small intestine collected by Speese, for which resection of the bowel was performed, 14 were also cases of intussusception.

Sarcoma is even more infrequent in the large than in the small intestine. It is understood that the rectum is not included in this discussion. According to the tabulation of Jopson and White and Libman, the proportion between sarcoma of the small and large intestine is about two to one.

The case in this series occurred at the splenic flexure. The tumor-cells had infiltrated the wall diffusely and so given rise to an obstruction. This case was the only one in the series arising in the descending colon and may possibly have been secondary to an ovarian sarcoma removed some years before. At any rate, it was a spindle-cell sarcoma and not a lymphosarcoma.

One of the things which has impressed itself in the study of six cases of lymphoblastomata arising in various parts of the abdominal cavity is the danger of a postoperative peritonitis. Four of these cases, each operated upon by different surgeons and in two different hospitals where a comparison was made with the results being obtained in other cases, compels one to believe that these patients have a decided susceptibility to infection, once the abdomen is opened.

About many types of lymphoid hyperplasia, there is much controversy as to their nature, whether they are neoplastic or inflammatory. In these cases, the author believes that we are dealing with true neoplasms. The lymphoid cells infiltrate through the capsule of the lymph-nodes and invade the surrounding structures, especially the mesentery, and spread to the adjacent lymph-nodes. There is apparently no difference in the connective tissue framework of a lymphosarcoma and that of any other round-cell sarcoma of equal cellularity. So far as the microscopical appearance of the tumor-cell goes, it is much the same as that described by MacCullum for lymphosarcoma arising in the abdominal region. The cell is large, usually 10 microns or more in diameter. It presents a round nucleus with its chromatin grouped in masses about the periphery. There is in each of these cells a relatively small amount of cytoplasm. Mitotic figures are numerous in all three specimens.

Because of their size, shape, and position together with their ameboid property, these cells make their way with the greatest ease into the surrounding structures and adjacent lymph-nodes. So it is this type of intestinal sarcoma that presents the greatest number of metastases and recurrences. For this same reason the mesentery should be resected widely with the involved intestine in case operative interference is attempted.

As Speese rightly observes, "Many cases diagnosed as round-cell sarcoma, probably belong to the lymphosarcoma group." One should not be content with a diagnosis of round-cell sarcoma, for this type of growth may be assumed by several types of cells.

The differentiation of lymphosarcoma from other types of round-cell sarcoma must be made by the morphology of the tumor-cell. In new-growths arising from lymphoid tissue, the tumor-cell presents itself as one of the cells of the lymphoid series. In other types of round-cell sarcoma arising in the gastro-intestinal tract, the tumor-cell presents as a rule, a tendency in certain areas to differentiate as do the cells from which it arose, i.e., the fibroblast or the smooth muscle-cell. In this way, by careful study and technique, the correct histological diagnosis can be made.

From the study of a single section it may prove impossible to differentiate the lymphosarcoma from several other forms of lymphoid overgrowth—especially from a gland involved by chronic lymphoid leukæmia or aleukæmic leukæmia (pseudoleukæmia without fibrosis). In lymphosarcoma there is not a leukæmic state of the blood. There is an infiltration form of growth with a regional distribution, as a rule.

So it is by a study of the clinical data, the relationship of the lymphoid overgrowth to the rest of the organism, and the microscopical sections taken from many portions of the tumor, that a diagnosis of lymphosarcoma can be reached.

The conclusions from the study are:

1. Tumors are a rather frequent cause of intestinal obstruction.
2. Sarcoma of the intestinal tract is more frequent than is usually thought.
3. There is a definite form of lymphoid overgrowth arising in the lymphoid tissue which by its behavior compels its classification as a malignant neoplasm.
4. Lymphosarcoma is the type of sarcoma most frequently met in the intestinal tract.
5. Early youth and middle life furnish the greater number of these cases, although they may appear at any age.
6. If the growth involves less than one-half the circumference, the tumor frequently brings about an intussusception.

E. C. ROBITSHEK.

Moore, J. W.: *Gastromesenteric Ileus*. N. Y. M. J., 1917, CV, 544.

The author reports two cases of gastromesenteric ileus as follows:

The first case, a married woman, aged 41, was admitted to the hospital with first degree burns of the hands and arms and extensive second degree burns of the chest anteriorly and over the lower half of the abdomen as a result of her clothes catching fire from the stove. Three weeks later the wounds of the hands and arm were healed; those of the chest

and abdomen were clean and healing rapidly. During the interval of three weeks, the patient was restless at night and partook sparingly of the soft diet which was ordered for her. On the twenty-second day of illness the patient began to complain of epigastric pains, followed by vomiting of light greenish fluid. She continued vomiting at frequent intervals in a retching manner until death, which occurred on the following day. The stomach was washed out a number of times without relief. Postural treatment was not attempted. During the last two days of illness, her temperature was subnormal, pulse about 120. Three days before death the bowels moved twice, but there was obstipation after that date. At autopsy the epigastrium was found to be distinctly bulging with some retraction of the abdomen below. On opening the peritoneal cavity the stomach bulged out of the incision like a balloon. The fundus filled the entire left hypogastrium, pushing the diaphragm up as high as the fourth interspace. The greater curvature extended well below the umbilicus, measuring 56 cm. in length. The lesser curvature was V-shaped and pushed against the liver, measuring 22 cm. in length. The diameter of the stomach in a line drawn parallel with the œsophagus was 10 cm. The pylorus was likewise markedly distended, measuring 10 cm. in circumference. There were no adhesions. The duodenum was U-shaped, tense, and uniformly dilated 6 cm. in diameter up to the root of the mesentery. The stomach contained a large amount of gas and about 500 ccm. of milky fluid, whereas the duodenum contained little or no gas, but was filled with a milky fluid; the patient had been given milk several hours before death. The walls of the stomach and the duodenum were thin, their mucous membranes being entirely negative. Beyond the root of the mesentery the small intestines were collapsed and, owing to a long mesentery, extended well over the brim of the pelvis, occupying the space of the uterus, tubes, and ovaries, which had been removed at a previous operation. There were no adhesions between the intestines and parietal peritoneum. The mesentery was thin and partially closed — fan-shaped. The cæcum was non-mobile and not distended. Before disturbing the relations of the abdominal viscera, the pressure of the stomach on the last portion of the duodenum was relieved by turning up the transverse colon over the chest wall. The jejunum remained collapsed and remained so even after moderate pressure had been made simultaneously on the anterior and posterior surfaces of the stomach. After the stretch of the root of the mesentery was relieved, stomach lying in position, the jejunum continued to remain collapsed, but when slight pressure was made upon the anterior surface of the stomach, the jejunum would fill rapidly. The contents of the jejunum was stripped into the duodenum and held there by traction on the root of the mesentery. When the stomach was put in place and the stretch of the mesentery relieved, the jejunum began to fill up,

but would cease to fill when slight traction was made upon the mesentery. The heart, lungs, spleen, and kidney were practically negative. There was no apparent deformity of the spinal column.

The second case, a male, colored, aged 86, was admitted to the Louisville City Hospital with a history of slipping and falling, striking the left side of the body and being unable to rise owing to inability to use the left lower extremity. On examination a few hours after the accident, the left lower extremity gave cardinal signs of intracapsular fracture of the left femur. The patient was propped in bed in a semireclining position and given soft diet, and for three days he did as well as could be expected; but at noon on the fourth day he was found dead in bed. The nurse stated that she had given him milk and, on returning thirty minutes later, found him dead. The pathological findings were practically the same as those in the first case, except that the lungs showed typical tuberculosis, and the ribs would bend and break with the slightest effort. The broken ends showed the bone to be a mere shell, less than 1 mm. in thickness, surrounding light red, pulsatous material. An intracapsular fracture of the neck of the left femur was found. Microscopic diagnosis of this condition was osteomalacia. The genito-urinary system showed a chronic infectious prostatitis, chronic cystitis, and chronic pyelonephritis. The circulatory system showed a chronic valvulitis and chronic aortitis. The gall-bladder contained a large number of stones and thick, tarry bile. The brain showed no gross lesion.

The cases herein reported of acute dilatation of the stomach and duodenum represent clinically to the internist a class of patients particularly prone to this symptom-complex. These patients are weakened, anæmic, emaciated, past middle life and bed-ridden through accidental happenings. The weakened condition was brought about in the first case by the constant absorption of toxic agents produced by the extensive burns of the skin; the weakened condition of the second case was due to the long and continued absorption of toxin produced both in the respiratory and genito-urinary tracts. Each patient was placed in a reclining position and this, coupled with relaxation of the abdominal and pelvic walls, as a result of wasting of the respective muscles, and absence of pelvic organs as in the first case, would add materially to the gravitation of the small intestines into the pelvis. Vomiting, retching in character, for the terminal twenty-four hours, was a constant feature in the first case. Though there were no external evidences of vomiting in the second case, nevertheless the autopsy findings point conclusively to antemortem vomiting by the aspiration of the vomitus into the bronchial radicals. The autopsy findings showed that the two cases had in common a marked dilatation of the stomach and duodenum up to the point where the root of the mesentery passes over the horizontal segment of the duodenum and the collapse of the intestine beyond this point; likewise a long and tensely drawn,

cord-like mesentery with ptosis of the intestine over the brim of the pelvis was found in each case.

EDWARD L. CORNELL.

Smithies, F.: The Etiologic Relationship Existing Between Gastric Ulcer and Gastric Cancer.
Illinois M. J., 1917, xxxi, 149.

The nature of gastric ulcer is considered under seven subdivisions:

1. Origin. Seven causative agents as classified by Bolton are given. The type of ulcer produced experimentally may vary slightly according to the method employed in causing it.

2. Course. In neither experimental animal nor the human being can the life history of any gastric ulcer be prognosed. The time required for ulcer formation or the healing of such seems to vary widely.

3. Malignant change. That some factor other than the persistent presence of an ulcer in a functioning stomach is necessary to result in the transformation of a benign process to a malignant one is apparently indicated by the fact that no experimental method has ever produced in animal or man a cancerous ulcer. No one has ever seen the actual transition from a benign process to cancer. It appears impossible to state definitely that an ulcer which shows cancerous change in a few spots of its edge was ever anything else than malignant.

4. Frequency of the transition of benign gastric ulcer to cancer has yet to receive its final solution. His study of 544 surgically demonstrated cases of gastric ulcer in no way indicates the frequency of cancer formation from such. It is impossible for even an approximately correct estimate to be made with regard to the frequency with which benign gastric ulcer becomes cancer.

5. Clinical variations in the symptom-complex of gastric ulcer. When certain clinical pictures of disease are found in association with the pathological proof that such disease exists, symptom-complexes can be reasonably formulated and only when measured by this rule are such above criticism. Symptomatology which is commonly associated with gastric ulcer, clinically, is the composite manifestation of a group of derangements among which we may include ulcer of the stomach.

6. Malignant change in duodenal ulcer. Out of 1,724 cases of operatively demonstrated peptic ulcer, the relation of gastric ulcer to duodenal ulcer was 1 to 2.45. Cancer was noted only 9 times in 1,181 cases of duodenal ulcer. When cancer of the duodenum is found it is commonly located at or near the papilla of Vater. Not infrequently duodenal ulcers, which have extended to the pylorus, assume malignant change in the stomach edge and nowhere else, showing a different character of the tissue of this part of the gut.

7. Gastro-enterostomy as a protection against malignant transition of gastric ulcer. In the author's series there were eleven instances where apparently benign ulcers appeared later with cancer of the stom-

ach after anterior or posterior gastro-enterostomy had been performed. It is not possible to state that such were not malignant at the time of operation. Clinically, in malignant disease of the stomach not associated with stenoses, gastro-enterostomy appears to grant a longer lease of life than where such has not been performed.

The nature of gastric cancer. The origin is unknown as no one has ever seen the actual beginnings, histologically, of malignant disease of the stomach. Evidence strongly supporting the pathologic proof that malignancy may develop in gastric ulcers that were apparently benign, is furnished by the histologic observation of all degrees of hyperplasia—benign, indeterminate, and malignant—in sections through different portions of excised ulcers.

The course varies as to the length of time, as there are wide variations in the rate of progress of the disease. Of the series of 953 cases of cancer of the stomach, the average duration of all symptoms of a clinically malignant type was 6.9 months previous to the patient's coming for relief.

The following tables given by Smithies best summarizes the work:

TABLE I

Summary of Facts From Study of 153 Operatively and Pathologically Demonstrated Cases of Gastric Cancer

1. Dyspeptic disturbance, clinically "ulcer," previous to a clinically malignant gastric disease in. . . . 543 cases, or 57%
2. Dyspeptic disturbance, clinically "atypic ulcer," previous to a clinically malignant gastric disease in. 93 cases, or 9%
3. A malignant gastric disease appeared without previous gastric disturbance in. 337 cases, or 35.7%

That Is

Of 953 proven cases of gastric cancer—in 640 cases, or 66 per cent, there was a chronic dyspeptic ailment, of the clinical type commonly associated with gastric ulcer, preceding the malignant period.

TABLE II

Summary of Clinical Facts—Benign Gastric Ulcer and Gastric Cancer

1. Average duration of all symptoms of 544 cases of benign gastric ulcer. 11.1 years
2. Average duration of clinically non-malignant dyspeptic period of "ulcer type" of 646 cases later evidencing malignancy. . . . 10.8 years
3. Average duration of clinically malignant dyspeptic period of cases in section 2 (above). . . 6 months
4. Average duration of all symptoms of 337 cases clinically malignant from inception. . 6.9 months

TABLE III

Gross Hæmorrhage In 544 Cases of Benign Gastric Ulcer and 953 Cases of Gastric Cancer

GASTRIC ULCER

Hæmatemesis alone.	30 cases, or 5.5%
Melæna alone.	14 cases, or 2.5%
Hæmatemesis with melæna.	146 cases, or 27.0%
Total bleeding.	190 cases, or 35.0%

GASTRIC CANCER

Hæmatemesis or melæna in.	162 cases, or 17.0%
Gross hæmorrhage at least 2 years previous to onset of malignant gastric ailment clinically in.	97 cases, or 54.0% of the hæmorrhage class

Of 79 cases exhibiting hæmorrhage within 2 years of coming under observation for malignancy—51 cases (66%) gave histories classifying them into the "ulcer-before cancer" group.

TABLE IV

Summary of Test-Meal Acidities of 544 Cases of Benign Gastric Ulcer and 953 Cases of Gastric Cancer

GASTRIC ULCER

Average free Hcl.	{ Retention group 57.0 Non-retention group 41.0
Average combined Hcl.	{ Retention group 16.0 Non-retention group 10.0
Average total acidity.	{ Retention group 76.0 Non-retention group 52.0
Hcl absent in 4 cases.	
Lactic acid present in no instance.	

GASTRIC CANCER

Average free Hcl.	{ Retention group 26.0 Non-retention group 17.0
Average combined Hcl.	{ Retention group 17.0 Non-retention group 7.0
Average total acidity.	{ Retention group 40.0 Non-retention group 15.0
Hcl absent in.	{ Retention group 66% Non-retention group 32%
Lactic acid present in.	{ Retention group 68% Non-retention group 34%

CARL R. STEINKE.

Pancoast, H. K., and Hopkins, A. H.: The Action of Pituitrin upon the Gastro-intestinal Tract of Man. *N. Y. M. J.*, 1917, cv, 289.

From a consideration of the literature it is apparent that there is a wide difference in the physiological activity of various commercial pituitary extracts. The subjects of these investigations did not suffer from any marked gastro-intestinal symptoms and the same preparation was used throughout, namely, pituitrin. Eleven cases were studied roentgenoscopically, a bismuth meal being administered and the peristalsis observed for thirty minutes, then at intervals of one or two hours, until the stomach was empty and the food column well advanced into the large bowel. As soon as the intestinal tract was found free of opaque contents, the drug study was begun. Pituitrin was given in doses of one ccm. hypodermatically from a minute or two up to twenty minutes before the second bismuth meal. Accurate notes were taken at each examination and roentgenograms taken at stated intervals.

In the stomach there was usually a primary depressing influence upon peristalsis or motility or both, followed by an increase in both. The same effect followed repeated doses. The pylorus was

influenced very slightly and when any effect was noted it was variable.

In the small intestine motility was as a rule either not affected or was slightly delayed, this delay being seen in those cases in which gastric motility was most depressed.

In the large bowel, the drug produced little or no appreciable effect on motility, but it was thought that the technique was not such as would give the most accurate data. It is probable that a colonic investigation would have to be carried out independent of that of the stomach and small intestine.

E. K. ARMSTRONG.

Long, J. W.: Enterostomy; a Perfected Technique.
J. Am. M. Ass., 1917, lxxviii, 833.

Long describes his technique for performing enterostomy for postoperative obstruction without an anæsthetic.

A few stitches are removed, the peritoneum opened, and the first distended coil of intestine which presents is seized. Into this a purse-string suture of chromic catgut, in a circle at least one-half inch in diameter, is placed rather deeply. Holding the intestine up by grasping the suture at three different points, a hole is burnt through the center of this circle by means of the Paquelin cautery, using the pointed tip. As soon as the perforation is made a rubber tube is immediately passed through it. The gut being elastic a tube twice the size of the opening may be used. The purse-string is then tied, inverting the margin. If conditions permit a second purse-string is also introduced. It is a good plan, when possible, to either stitch omentum about the tube, or to puncture the omentum and pass the tube through it. The tube is best secured from slipping by attaching it to the skin with strips of adhesive plaster.

ALBERT EHRENFRIED.

Urrutia, L.: Spasmodic Occlusion of the Anastomotic Mouth as a Cause of Failure in Gastro-enterostomy (Sur l'occlusion spasmodique de la bouche anastomotique comme cause d'insuccès de la gastro-entérostomie). *Arch. d. mal. de l'appar. digest.*, 1917, lx, 84.

The author refers to a publication by Zweig about three years ago concerning a gastro-enterostomy with pyloric exclusion in which the new opening did not function. Zweig diagnosed spasmodic occlusion rather than any mechanical obstruction, and found that satisfactory results were obtained by the administration of papaverine.

The author in a similar case found that the administration of papaverine did not give results, but that complete success was obtained by administering belladonna.

The author is satisfied that his patient like Zweig's was vagotonic with gastric hypertony, but unlike Zweig's results with papaverine, he found it quite inefficacious while the immediate result from belladonna was extraordinary.

W. A. BRENNAN.

Stewart, F. T.: Method of Gastro-Enterostomy.
Tr. Am. Surg. Ass., Boston, 1917, June.

The stomach and the intestine are united with a serous suture. The peritoneal coat of the stomach is incised parallel with the suture line, the blood-vessels caught with hæmostats before being opened, and then the mucous membrane cut between the rows of forceps. The intestine is treated in a similar manner. Each pair of vessels (one gastric, one intestinal) in the posterior wound edges is tied with a single ligature, after drawing the edges together by means of the two forceps (one on the stomach, one on the intestine) in close proximity. The anterior edges also are drawn together by ligatures which invert these edges. The two forceps which lie opposite each other are approximated. The right end of the ligature is passed around the forceps on the intestine from right to left, the left end around the forceps on the stomach from left to right, thus the ends emerge between the forceps beneath the loop of the ligature. The forceps are brought parallel to the long axis of the wound, rolled toward each other, thus inverting the mucous edges, the ligature tied, and the forceps removed. Each succeeding pair of vessels is dealt with in a similar manner. The serous suture is then continued along the anterior portion of the anastomosis. The operation is easier to perform and less dangerous than that with clamps. Hæmostasis is assured. A larger anastomosis can be made with the same amount of stomach and intestine than when clamps are used. There is no crushing or contusion.

Goecke, C.: The Morphology of the Stomach After Resection (Beitraege zur Morphologie des Magens nach Resektionen). *Beitr. z. klin. Chir.*, 1916, xcix, 294.

The author has studied the postoperative morphology of the stomach by means of radioscopy in 55 cases of gastric resection. He distinguishes two kinds of resections (1) in the stomach's continuity, mediogastric or annular resection, 19 cases; and (2) pylorogastric resection. The latter is subdivided according as the resection was followed by gastroduodenostomy, 14 cases, or by gastrojejunostomy, 22 cases.

In the case of mediogastric resection, almost always done for ulcer, after the operative act the stomach shows under one of these three forms: (1) with a prepyloric pouch, and slow evacuation of contents; (2) without prepyloric pouch, with accelerated evacuation; (3) with displacement of the pylorus to the right, accelerated evacuations.

In the case of resection of the gastric aboral pole followed by gastroduodenostomy the findings differ according as the anastomosis is made by Kocher's method, terminolateral, or by the Billroth I method and its modifications, terminoterminal. With the Kocher technique a form of the stomach is obtained somewhat similar to normal. In cases of very ample resection the postoperative radioscopic image shows a small vertical stomach. The evacuation of the

stomach contents takes place in normal time with sensible acceleration. With the Billroth technique, there is no definitely typical form of stomach noted postoperatively.

If the gastric resection is done according to the method of Perthes, joining all the free residual margin of the gastric stump to the free margin of the duodenum, reducing the circumference of the first by sutures, the postoperative radioscopic images are similar to those observed after a Kocher resection with gastroduodenostomy; small stomach in the form of a cup, sometimes with a prepyloric sac, slight evident peristalsis, and rapid evacuation into the duodenum.

When pylorogastric resection is followed, as is generally the case, by a gastrojejunostomy the postoperative findings differ according as the anastomosis is done according to the Billroth II method or that of Reichel, or Reichel's method modified by suture of the gastric stump. With the Billroth II technique (closure of the two gastric and duodenal stumps and posterior retrocolic gastrojejunostomy) the stomach, if it is possible to draw deductions from the author's single case, has a form similar to that observed after Kocher's technique, and there is good functioning, rapid evacuation and normal peristalsis. After Reichel's technique, mostly used in the author's Tuebingen clinic (joining of the gastric residue to the side walls of a jejunal loop), the stomach is observed small, narrow, vertical, with rapid emptying which causes some sensation of hunger. The duodenal contents regularly regurgitate into the stomach. If to Reichel's technique is added contraction of the gastric stump orifice by sutures we observe the possibility of a complete filling of the stomach and the absence of accelerated evacuation, without any symptoms of stenosis. The postoperative radioscopic images approximate those after pylorogastrectomy and consecutive gastroduodenostomy according to Kocher.

W. A. BRENNAN.

Grulee, C. G., and Lewis, D.: Diagnosis and Treatment of Congenital Stenosis of the Pylorus (Diagnostic et traitement de la sténose congénitale du pylore). *Arch. d. méd. d. enf.*, 1917, xx, 57.

The authors give details of 16 cases of congenital stenosis of the pylorus observed in the Presbyterian Hospital, Chicago, during the last six years. Of these cases, 15 were operated upon with 3 deaths, giving a mortality of 20 per cent.

The principal factors which enter into the diagnosis are: age, continuous vomiting, diminished stools, loss of weight, and epigastric distention, especially after feeding which is often followed by explosive vomiting. Examination of the stomach contents and X-ray examination are of little aid toward diagnosis.

The authors think that when a diagnosis of congenital pyloric stenosis is established it is an indication for operative treatment. Some years ago the results of such operations were so uncertain that

surgical treatment was not usually recommended. In 1906 Thomson collected 156 cases of congenital pyloric stenosis from the literature and added one case of his own. Of these 89 were operated upon as follows:

	No.	Cured	Dead	Mortality
Pylorectomy	1	0	1	100 per cent
Divulsion	17	8	9	53 per cent
Pyloroplasty	12	6	6	50 per cent
Gastro-enterostomy ..	59	29	30	51 per cent
Total	89	43	46	51+ per cent

Since then the mortality has been much reduced, and the operative technique favored is either posterior gastro-enterostomy or pyloroplasty. Richter, and Downes have generally employed posterior gastro-enterostomy with respective mortalities of 14, 24, and 32 per cent. The global mortality in all cases was 22 per cent.

The authors' series of operated cases gives a mortality of 20 per cent. In performing gastro-enterostomy they make the abdominal incision through the linea alba. Downes employed pyloroplasty according to the Rammstedt method in 35 cases with a mortality of 23 per cent. He thinks that this method has advantages over gastro-enterostomy as regards duration of operation, early nourishment, a lesser severity of postoperative vomiting, and of complications such as diarrhoea.

The authors have not found any serious postoperative complications after gastro-enterostomy and they think that it is a simple method of dealing with the condition in infants. The latest results seem to indicate that gastric functions and development of the child are not interfered with in this method. Lesions to the mucosa during Rammstedt's operation is a serious complication. During a gastro-enterostomy the surgeon has a better chance of rectifying a technical error than in the case of Rammstedt's operation.

The principal means of lessening mortality is by early recognition of the condition. The authors place great stress on the necessity of careful postoperative treatment especially in the feeding of the child.

W. A. BRENNAN.

Gallie, W. E., and Robertson, L. B.: Pyloric Stenosis in Infants. *Canad. M. Ass., J.* 1917, vii, 1.

The authors give a résumé of the symptoms, diagnosis, treatment, and pathology of pyloric stenosis in infants, based on a study of 16 operative cases in the past two years in the Hospital for Sick Children, Toronto.

If the condition is not treated, the mortality is 100 per cent. Under medical treatment, consisting of proper feeding and gastric lavage, the mortality is from 40 to 64 per cent. However, medical treatment is very prolonged and tedious, and so uncertain that if the patient does not respond promptly more radical measures are indicated. Operation should be undertaken before the starvation of the patient makes it dangerous.

The symptoms are uniform and unmistakable. The first indication of any abnormal condition is the

sudden onset of projectile vomiting soon after feeding. The weight rapidly falls. Bowel movements become less and less frequent, and there is a similar reduction in the outflow of urine. Distention of the stomach with visible peristalsis from left to right is evident upon examination. These waves are two or three inches long and extend across the stomach. This symptom alone may be taken as pathognomonic of pyloric obstruction. Palpation slightly to the right of the middle line above the umbilicus will usually locate a hard, round tumor, about the size of an acorn, and freely movable. The condition rarely occurs after the third month of life.

The stenosis is due entirely to the hypertrophied muscle, no diminution in the size of the tube of mucous membrane being evident. This hypertrophied muscle is from three-sixteenths to three-eighths of an inch in thickness. The mass is smooth and white in color. Section shows that there is an increase both in the size and in the number of muscle-fibers. The cause of such a pathologic condition is as yet unknown.

The treatment varies with the degree of the closure of the pyloric outlet. In case of complete obstruction immediate operation is indicated. If the symptoms are not so severe, it may be wise to study the case for a short time. However, if in spite of careful feeding and regular lavage, the retention increases and the symptoms are exaggerated, surgical intervention is indicated.

The Webber-Rammstedt operation is less dangerous than the posterior gastro-enterostomy, and produces more immediate relief. In this procedure, the abdomen is opened through the right rectus above the umbilicus. The tumor is delivered and while held firmly between the thumb and the forefinger of the left hand, an incision is made into the tumor in the line of the axis of the gut, extending the full length of the swelling. This incision is carefully deepened until the mucous membrane begins to bulge into it. With scissors, the muscle is gently separated from the mucous membrane and the incision stretched open so that the membrane is exposed for a width of an inch or more. There is practically no bleeding, but if any small vessels have been cut, they must be tied. The operation should not require more than fifteen or twenty minutes, and since there is little manipulation of the viscera, it is remarkable how little surgical shock results.

The operation is followed by a very careful post-operative regimen. Hypodermoclysis of 100 to 200 ccm. of normal saline and 4 per cent glucose solution follows operation; stimulation is provided in the form of hypodermic injections of adrenalin in 5 minim doses; the patient is kept at normal temperature by careful wrapping and hot water bottles; and until the effect of the anæsthetic is over the baby is kept with head downward, the position then being changed to the semi-upright, to facilitate emptying the stomach and the eructation of gas. Careful feeding is very essential for recovery. An hour after

operation, a few drams of water are given; an hour later, three drams of the mother's milk and one of water. This is repeated at three-hour intervals. If possible, breast milk should be provided and normal nursing should be resumed in a week or ten days.

Following the Webber-Rammstedt operation, the feedings are readily taken and retained, the excretion of urine returns to normal, and in a day or two fecal material reappears in the stools. In a week, bowel movements become normal, and the weight begins to rise. In two months, the babies are perfectly normal.

H. G. SLOAN.

Preble, W. E.: *Intestinal Toxæmia and Sequelæ.*

Boston M. & S. J., 1917, clxxv, 296.

According to Lane, the primary factors in the production of stasis and toxæmia are mechanical. Overloading, distention, and descent of the colon are followed by the formation of adhesions which, contracting, pull the hepatic flexure higher up and kink the ileum sharply. Kellogg has attempted to demonstrate that Lane's list of diseases are the result of incompetency of the ileocecal valve, permitting reflux of the contents of the colon into the ileum. Martin, however, believes the condition to be a stenosis of the valve, while Case thinks obstructive conditions of the sigmoid are responsible. Such a variation of opinion shows that the subject is still in a state of evolution.

Investigation of the theory of toxins formed in the bowels leaves the situation unsolved, so far as finding chemical or bacterial poisons that will cause the symptoms and pathology of any considerable number of the diseases presumed to be due to intestinal toxæmia. Subinfection as the primary cause in many of these diseases of doubtful etiology has been advanced by Adami, the work of Billings and Rosenow on focal infections supplementing this. Many of them are undoubtedly the result of faulty metabolism, while a certain number may be due to faulty nutrition dating back to pre- and postnatal periods.

The end-results of Lane's cases short-circuited for arthritis from 1909 to 1914 showed a death rate of about 25 per cent in 33 operations. Bottomley's report on 29 cases showed that 42 per cent were cured or greatly improved; 55 per cent greatly improved; 14 per cent worse; no change 24 per cent; deaths 6.5 per cent. In most series of cases reported, recurrence of symptoms and trouble from adhesions and obstructive conditions appear with marked frequency.

The medical treatment includes proper habit formation as regards bowel evacuations; exercise; massage of the abdomen; support; diet; water drinking; medicinal agents. Surgery should be resorted to only in two classes of cases, those showing definite obstruction and those in which the primary cause of the trouble is removable, and may be located beyond reasonable doubt at the site of the proposed operation.

E. K. ARMSTRONG.

Richardson, E. P.: Jejunal Ulcer; a Report of Two Cases Treated by Resection and End-to-End Anastomosis of the Jejunum. *Boston M. & S. J.*, 1917, clxxvi, 118.

The author gives a general résumé of the subject of jejunal ulcer as one of the untoward results of gastrojejunostomy and reports two cases in detail.

The first case was reported by Braun in 1899 and Lieblein in 1915 analyzed 129 reported cases. Paterson divides them into gastrojejunal ulcers and jejunal ulcers proper; the former being due to non-absorbable suture material and the latter as a result of altered physiological processes. Numerous experiments by Wilkie and Soresi bear this out.

A brief résumé of the analyses of Lieblein and Swartz follows. These show the tendency of the jejunal ulcers to deep penetration and serious complications resembling duodenal and gastric ulcers. Also, that in the treatment the operative mortality of jejunal ulcer following posterior gastro-enterostomy is greater than in those following anterior. In cases of gastrojejunal ulcer there is less tendency to perforation and a greater liability of stenosis of the stoma.

The detailed clinical, X-ray, and operative records of the author's two cases are given.

The etiology of jejunal ulcers is still uncertain. Paterson suggests three conditions as a cause: (1) hyperacidity; (2) normal acidity, but hypersecretion; and (3) normal acidity, but diminished or diverted flow of bile and pancreatic juice. Further factors may be a delay in passing along the gastric discharge by kinking or spasm, and interference with the circulation which would lessen the amount of antipeptic ferment brought to the mucosa. In gastrojejunal ulcers the rôle of infection is clearer.

Regarding symptoms the chief is the occurrence of persistent irregular pain in a gastrojejunostomy which may be otherwise functioning well accompanied by local tenderness over the region of the stoma. The X-ray may give confirmatory evidence—retention, hyperstalsis, spasm, deformity of stoma, and narrowing of jejunum.

The treatment is chiefly surgical, and the earlier the better. In gastrojejunal ulcers excision and plastic procedures are indicated. Inspection by stomach or jejunum is advisable. In jejunal ulcers resection is the best method. Prophylaxis, however, in gastro-enterostomies is most important and the posterior short-loop procedure best fulfills this condition, using absorbable sutures. An anti-acid diet should follow for some time.

Richardson concludes as follows:

1. Jejunal ulcer may occur after posterior short-loop gastro-enterostomy.
2. Persistent pain, following gastrojejunostomy, especially if accompanied by local tenderness over the stoma, should suggest jejunal or gastrojejunal ulcer.
3. Such ulcers are characterized by a tendency to deep penetration.

4. Surgical treatment undertaken early is likely to be less dangerous and more effective.

P. M. CHASE.

Barber, W. H.: The Advancement of the Ileocolic Sphincter in Surgical Constipation. *Interst. M. J.*, 1917, xxiv, 9.

Observations on the ileocæcal valve, its function and anatomy, are reported together with a technique of operative procedure applicable to those cases of surgical constipation wherein the removal of the colon, in part or wholly, is indicated.

The ileac sphincter resembles in structure the biliary and ureteral sphincters in the obliquity of the anastomosis and in the relative preponderance of the circular muscular fibers in the immediate proximity of important nodal tissue.

Anatomically, the ileum is only partially inverted into the colon, for the mucous, submucous, and circular muscular coats appear in the sphincter and the longitudinal musculature and serous layers remain outside.

The function of the sphincter is not definitely established; some claim a regulation of the ileac effluent into the colon, others a prevention of regurgitation, and still others a combination of the two. However, Keith of London has demonstrated nodal tissue in the anterior and posterior portions of the cæcal collar about the termination of the ileum being similar to that around the bile-duct and ureter. This would establish the region as an important nodal relay in the intestinal tract. Likewise, Alvarez has definitely established the interdependence of the upper end of the small gut upon the lower end in so far as its intestinal tone is concerned.

Surgical constipation implies any obstruction, dynamic or adynamic, of the terminal small or large gut in which surgical intervention is indicated. Lane and his school are the mechanists, while Keith, Alvarez, and the author believe it to be due to physiological impairment of the neuromusculature. The various forms of operative intervention are here discussed and criticized.

The author's advancement operation consists in removing the amount of large intestine advisable still retaining, however, the ileocæcal valve and a small cuff of cæcal wall containing the important nodal tissue; the anastomosis being between this cuff and the cut end of the retained large bowel. Care must be exercised that the ends of the ileocæcal vessels are caught and ligated only as they appear in the cæcal collar, not in the mesentery.

P. M. CHASE.

Lane, J. W.: Ileostomy for Ileus and General Peritonitis. *Boston M. & S. J.*, 1917, clxxvi, 304.

The theories of the cause of death in intestinal obstruction include the supposition that loss of water is responsible, that a toxic substance is the cause, that this toxic substance is not a chemical poison, and that the cause is due to some aberrant

activity of duodenal and pancreatic cells. In acute general peritonitis the picture is practically the same as at the end of intestinal obstruction.

It would seem that the logical treatment of these advanced cases of ileus is drainage of the intestines, the problem being to determine the best method of accomplishing this end. Cæcostomy, high jejunostomy, and ileocolostomy are all advocated, but the author does an ileostomy, bringing up a loop of small intestine which is held outside the skin. If, at the end of six hours there is persistent vomiting and bowel movements are unsatisfactory, an opening is made in the exposed loop of gut. In acute intestinal obstruction, the technique is varied somewhat, but it is almost impossible to perform it improperly. The objection is that a major operation is necessary to its closure, but the openings often close spontaneously. Even the artificial closure is not difficult.

It has been found dangerous to open the bowel at the primary operation, but after one hour this danger is no longer present. In case of early post-operative ileus, cultures of the bacillus acidophilus have been used with satisfactory results.

E. K. ARMSTRONG.

Morf, P. F.: Acute Appendicitis; Analysis of Eight Hundred and Twenty-two Cases in Which Operation was Performed at the Cook County Hospital. *J. Am. M. Ass.*, 1917, lxxviii, 902.

From November, 11, 1912, to February 22, 1916, 822 patients with acute appendicitis were operated upon. Of these, 766 recovered and 58 died, a mortality of a trifle over 7 per cent.

Of the 58 cases terminating in death, 17 showed a general peritonitis at the time of operation. These should be considered as cases of general peritonitis, as the complication (general peritonitis) is of far greater importance than the original condition. Deducting these from the 58 cases which terminated fatally, there is a mortality of not quite 4.98 per cent for what might be called uncomplicated acute appendicitis.

Of the 445 patients operated upon for simple acute appendicitis, 5 died, a mortality of a trifle over 1 per cent. Of the 266 patients operated upon for acute appendicitis — suppurative, gangrenous, perforating — with abscess, 6 died, a mortality of 2.2 per cent.

Of the 127 patients having gangrenous appendicitis without abscess formation, 7 died, a mortality of 5.5 per cent. From this it would seem that abscess formation should be considered as an indication of resistance on the part of the organism.

Of the series, 150 cases occurred in children under 15 years of age. Of these, 138 recovered and 12 died, a mortality of 8 per cent.

From the data given in the tables, the following conclusions may be drawn:

1. General peritonitis is still the most frequent complication of acute appendicitis. In a small number of instances, a critical study of the clinical history reveals that this complication seems to have

been caused by too early removal of the drain in abscess cases. Drainage tubes, gauze, etc., should be removed gradually to avoid inclusions and subsequent spread of infection.

2. Early operation means a low mortality.

3. Abscess formation may be considered as evidence of resisting power on the part of the organism.

4. Fæcal fistula, while comparatively frequent and annoying, has little importance in increasing mortality.

5. Abortion is not greatly to be feared if appendicitis occurs during pregnancy.

EDWARD L. CORNELL.

Morris, R. T.: Four Kinds of Appendicitis. *Med. & Surg.*, 1917, i, 91.

Morris briefly describes the three most common forms of appendicitis and adds a fourth classification.

The most common type is that of fibroid degeneration in the walls of the appendix. According to the author this is not an infectious process but rather an irritative one, due to the contraction of the hyperplastic connective-tissue upon the nerve-endings in the appendix. Likewise, such an appendix is less liable to infection because the structures usually involved in bacterial invasion are disappearing, and because this chronic irritation induces a hyperleucocytosis.

The first symptom is that of hyperæsthesia of the right lumbar sympathetic ganglia. This is due to the efferent impulses from the cord center by way of sensori-motor synapsis to these ganglia as well as to the skin in the head zone.

The second symptom is that of distention of the ascending colon with gas. This is due to the overstimulation, through the irritated appendix nerves of the colonic musculature with subsequent exhaustion and relaxation.

The third symptom is that of transitory pains in the appendix region. This is no doubt due to the development of a certain degree of immunity to the chronic irritation which is at times upset by different causes.

The next most common form of appendicitis is the acute intrinsic infective type.

The third is the extrinsic infective type, the complement of extensive infection in the neighborhood, such as pyosalpinx or ovarian abscess.

The fourth type that Morris adds is the syncongestive form, the accompaniment of congestion belonging to other structures in the vicinity, such as occurs in typhoid. Appendix symptoms in such instances are probably due to the fact that the soft inner coats of the appendix find difficulty in swelling within the light outer sheath.

P. M. CHASE.

Glinnes, W. A.: Intestinal Parasites as Cause of Appendicitis. *Bol. de la Asoc. méd. de Puerto Rico*, 1916, xiii, 249.

The author examined a series of 100 appendices in cases of appendicitis with the view of finding

the parasitic contents. The specimens were secured from autopsies performed at the Colon Hospital, Canal Zone, within one-half to five hours after death. The subjects were mostly West Indian male negroes.

Of the 100 cases, 59 appendices were normal; ova were found in the remaining 51, the most frequent variety being *trichocephalus dispar*, 20 cases; *entamoeba*, 12 cases; *uncinaria americana*, 9 cases.

W. A. BRENNAN.

Mayo, W. J.: Diverticulitis of the Large Intestine.

Tr. Am. M. Ass., Sect. Obst., Gynec. & Abdom. Surg., N. Y., 1917 June.

Since the recognition of the condition, the Mayos have resected portions of the large intestine for diverticulosis in 42 cases. In 36 the sigmoid was involved, in one the transverse colon, in one the ascending colon, in one the hepatic flexure and cæcum, in one the rectosigmoid juncture, and in two the rectum. The diverticula were all of the acquired variety; the mucous coat pouched through small openings in the musculature in contradistinction to congenital diverticula in which all the intestinal coats cover the sac. The diverticula were multiple and occurred at weak points in the circumference of the colonic wall, such as vessel holes, muscle defects, etc. From 1 to 8 inches of the intestine were seriously involved, although much longer stretches often showed a diverticulous tendency. Hardened masses of faeces were found in the distal extremity of many narrow-necked diverticula. As a rule, only one or two of the diverticula were directly responsible for the existing diverticulitis and peridiverticulitis.

The signs and symptoms resembled those of appendiceal inflammation, with the marked difference that in the great majority of instances the disorder was on the left side of the abdomen.

Sixty-six and six-tenths per cent of the cases were males and 33.4 per cent females.

Group 1. *Self-limiting diverticulitis and peridiverticulitis.* Fleishy middle-aged persons with an acute sensitive tumefaction in the left iliac fossa. The mass gradually disappears in the course of several days, with restoration to health. The disturbance is due to irritation of infected contents in the thin-walled, narrow-necked sacs. That diverticulosis does not always produce trouble is shown by the relative frequency with which this condition is found postmortem, by the frequency with which diverticula of the sigmoid are chance findings in the course of abdominal operations for other purposes, and by the frequency with which routine X-ray examination of the colon shows symptomless diverticula. We should not assume, therefore, that the presence of these diverticula, or even a single mild attack of diverticulitis which quickly subsides without obstruction or other serious symptoms, necessitates operation.

Group 2. *Diverticulitis and peridiverticulitis with formation of abscess resulting in enterovesicle, entero-*

cutaneous, and other fistulae. Spreading peritonitis with abscess formation or the results of infectious processes which connect the diseased colon by fistulous tracts with the cutaneous surface or neighboring intestines and especially with the bladder. If an abscess forms it should be opened and drained, but a serious attempt should not be made at the primary operation to remove either the infected diverticula or the section of colon which contains them. The frequent obesity of the patient and the enormous amount of scar tissue which surrounds the fistulous tracts add greatly to the operative difficulties. In enterovesical fistulae, which are most common, they have opened the peritoneal cavity, dissected out the fistulous tracts, and closed the openings in the bladder and colon with chromic catgut sutures.

Group 3. *Obstruction.* In acute diverticulitis the obstruction is the result of infection, oedema, and adhesions. Chronic obstruction is usually of the hyperplastic stenosing type. In this group a tumor is usually found. Obstruction may not be complete but may require a colostomy for relief made as close as possible to the tumefaction so that it may be resected with the growth. Or it may be preferable to open the ileum at the cæcum and completely divert the intestinal contents until after the resection of the diseased sigmoid.

Group 4. *Carcinoma developing on a diverticulum.* This group is of great interest. Among the 42 cases of resection for diverticulitis, there were 13 in which carcinoma coexisted, 31 per cent. The carcinoma had such definite relationship to the diverticulitis as to make it reasonable to assume that infection and irritation by hardened focal masses in diverticula were the cause of chronic irritation and precancerous change.

Some of the patients with carcinoma associated with diverticula gave a long history of having had, at various times, inflammatory attacks with development of tumefactions which disappeared. Some of these patients had lived for years with a colostomy made for supposed cancer. After the carcinoma developed, the symptoms became more or less constant.

It is of great value to be able to differentiate between diverticulitis and carcinoma, as in diverticulitis the removal of the mass of tissue which would be essential in carcinoma is not necessary.

Keefe, J. W.: The Advantages of Conservative Surgery in Operations for Diverticulitis of the Descending and Pelvic Colon. *Boston M. & S. J., 1917, clxxvi, 271.*

Many conflicting opinions are held in regard to the etiology of this disease. Klebs believes that it results from traction exerted on the bowel by the mesentery, and Hansemann believes that pulsion within the bowel is the primary cause. As a further instance of the existing diversity of opinion, Kleb's statement may be mentioned, that the condition occurs in fat people, while Hansemann seems to lay

emphasis on the fact that most of his subjects were lean.

Although the consensus of opinion seems to be that diverticula occur in middle life, nevertheless, there are a few cases recorded occurring at the age of three and seven years.

The author believes that Kleb's theory of traction on the mesentery being a causative factor is hardly tenable, inasmuch as it fails to explain the occurrence of diverticula on the side opposite the mesentery.

It can be demonstrated that the mesenteric border is not the weakest part of the bowel. When distended artificially during life, rupture takes place opposite the mesentery. Intramesenteric ruptures, if they do occur at all, are rare.

With ileus of the intestine, he finds that the peritoneum and underlying muscle layers tear and separate, not at the mesentery, but generally more or less opposite the mesenteric attachment. The theory, advocated by some observers, that the sheaths of veins constitute a weak point and are, therefore, a factor favoring the development of diverticula, is conceded to be correct to the extent that, on the mesenteric side of the gut, they constitute a path of least resistance along which a diverticulum is likely to develop.

Beer, who has thoroughly studied the subject experimentally and clinically, after numerous experiments and an exhaustive study of the literature, arrives at the conclusion that the primary factor in the development of the diverticulum is a muscular deficiency in the intestinal wall; traction of the gut by the mesentery and intra-intestinal pressure due to the accumulation of gas and feces, incident to constipation, being secondary factors. Keefe believes that this theory is in consonance with the results of all approved experimental investigation and clinical observation.

The symptomatology of this condition is generally definite and characteristic, and failure to recognize it is due, not so much to the absence of well-defined symptoms, but to the fact that the subject is one, the surgical significance of which is not duly appreciated by the medical profession.

In general, the symptoms are those of appendicitis, with the exception that they are localized on the left side instead of the right. There is generally a chill and a rise in temperature, with a leucocytosis; pain, usually of sudden onset, and definitely localized in the left lower quadrant; tenderness on pressure; muscular spasm; and a sense of resistance or a palpable mass to be felt in this region.

Vesical tenesmus and frequency of micturition occasionally occur. These symptoms, suggestive of acute inflammation, may subside in a few days, but are usually followed by recurrent attacks.

At times, it is extremely difficult to differentiate it from carcinoma, pelvic peritonitis, tuberculous and luetic growths, and left-sided appendicitis.

Many non-malignant tumors, the result of pathological processes originating in an infection of a

diverticulum, have been mistaken for carcinoma, and the frequency of this error is to be explained by the fact that the location of these tumors of the descending and the pelvic colon, and the period of life in which they generally occur, the so-called cancerous period, naturally suggest a malignant growth.

The author believes in many instances, not until the tissue has been submitted to a pathological examination, has the diagnosis of diverticulitis been made. Cases diagnosed as carcinoma, in which colostomy had been performed as a palliative measure, and which lived far beyond the period which the supposed diagnosis warranted, were, no doubt, cases of diverticulitis.

In a series of twenty-seven cases, with a mass in the large intestine, and all occurring in the "cancerous period," 74 per cent proved to be cases of diverticulitis. The masses were found to be inflammatory tissue with diverticula in the colon. From these facts two valuable lessons may be learned: first, in exploratory laparotomies, scrupulous care should be exercised by the surgeon in handling the large intestine, especially the sigmoid, on account of the danger of rupture of an abscess in cases of frail diverticular walls, due to pressure; secondly, it is hazardous to give a definite diagnosis and prognosis without a pathological report.

In the differentiation of diverticulitis from carcinoma, a proctoscopic examination is of no value, except in the rare cases in which intussusception has occurred into the rectum.

The presence of blood in the stools is an important diagnostic sign in favor of the diagnosis of carcinoma, while its absence warrants a suspicion of diverticulitis.

The greatest aid in differentiating between these two conditions, however, is afforded by roentgenology. The success or failure of an X-ray examination, in a case of diverticulitis, depends on two factors: (1) whether or not the diverticulum is filled with a fecal concretion which might preclude the possibility of the entrance of the barium; and (2) whether or not the inlet to the diverticulum is stenosed, since cases have occurred in which stenosis had progressed to such a degree that the liquid enema was prevented from entering.

While it is true that a diverticulum may be present giving rise to no pathogenesis, yet in 60 per cent of cases infection does take place through these intestinal diverticula, and complications of a grave nature frequently arise, and may terminate fatally.

The most constant finding is that of a chronic extramucosal inflammation, which frequently results in tumor formation, which is mistaken for carcinoma.

Peritonitis results from perforation of a diverticulum, the walls of which have become thinned out from pressure and ulcerated by the presence of fecal concretions, with attendant bacterial invasions.

Acute or gangrenous inflammation of a diverti-

culum occurs, frequently resulting in an abscess, which may remain localized or may rupture into the general peritoneal cavity, intestine, or bladder. This condition is made manifest by fulminating symptoms of peritonitis. We may also have a retro-peritoneal abscess or an abscess may rupture between the mesenteric folds, and several cases are recorded in which an abscess extended even to the liver and the left kidney.

Another serious condition to be borne in mind is the possibility of adhesions of the inflammatory mass to adjacent structures, with the attendant danger of intestinal obstruction. Fistulæ and fistulous tracts between the diverticulum and some viscus are of rather frequent occurrence. Fistulæ between the bowel and the bladder are the most common.

One of the more unusual complications is chronic mesenteritis, resulting in thickening and kinks, a possible cause of volvulus. As one of the very rare sequelæ, it is interesting to report one case of metastatic suppuration in the liver, resulting from a diverticulitis. Finally, it must be remembered that a diverticulum may undergo malignant, degenerative changes resulting in carcinoma.

Keefe believes the surgical procedure which will be found applicable in the largest number of cases is as follows: Through a left rectus or muscle-splitting incision in the left iliac region, the left lower quadrant is explored, and if an abscess is found it is drained. Although some surgeons advise the removal of the diverticulum coincidently with the draining of the abscess, the more conservative plan of deferring this to a subsequent time, when a more extensive operation can be undertaken with less hazard to the patient, is to be commended.

E. C. ROBITSHEK.

Summers, J. E.: A Simple Method of Resecting the Transverse Colon with Preservation of the Omentum; Likewise for the Suspension of a Prolapsed Colon. *Tr. Am. Surg. Ass.*, Boston, May 31, 1917.

The sacrifice of omentum following resection of the transverse colon leaves unprotected peritoneal surfaces. Lardennois, Okinczyc, and Pauchet have worked out a technique by means of which the omentum can be easily and safely separated from the transverse colon, along the bloodless "peritoneal ligament," as the author designates it, at the juncture of the layer of peritoneum covering the stomach anteriorly and the omentum both anteriorly and posteriorly, with that enveloping the transverse colon. To make the resection the bowel is delivered through a liberal incision, and held taut: the omentum is lifted sufficiently to recognize the line of juncture of its under surface with the upper surface of the colon; the peritoneum is nicked along this ligamentous line to the desired extent, and the omentum freed upward. The resection of the colon is then done in the usual manner. After the anastomosis is completed the omentum is made to cover

the line of suture, and otherwise to resume its protective position.

The author, during the past year, has used this technique—resection of the transverse colon—with great satisfaction, and finds it easy of performance and of value to the patient. It is only applicable for non-malignant diseases. When it is deemed proper to correct ptosis of the transverse colon by operative procedure, in a number of patients he has resorted to the following technique: The freeing of the omentum is carried upward, thus widely opening the lesser cavity of the peritoneum, and exposing the posterior wall of the first portion of the duodenum, the pancreas, and the whole of the posterior wall of the stomach. The transverse colon is then sutured to the posterior wall of the stomach along its greater curvature, thus placing the transverse colon in the lesser peritoneal cavity; the omentum is then dropped forward. In several instances, in addition, a gastropexy has been carried out. This the author believes to be probably unnecessary. The technique in itself is sure and certain, but it will require a longer period of observation as to after-results, before a definite opinion as to its utility can be formed.

Proust, R.: End-Results of Resection of the Transverse Colon for Colloidal Epithelioma (Résection du colon transverse pour épithélioma colloïde; résultats éloignés). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 51.

Proust presented a patient on whom he had operated seven years ago for an epithelioma of the transverse colon. This man had been presented two years previous to show the good end-results of resection which had been carried out extensively and in one stage. Unfortunately now this patient commences to show signs of recurrence, showing that even very long periods of recovery can often be considered as relative only.

W. A. BRENNAN.

LIVER, PANCREAS, AND SPLEEN

Howell, J.: Rotation of the Liver on Its Vertical Axis. *Brit. M. J.*, 1917, i, 219.

While performing cholecystotomy upon a female patient Howell found the liver disoriented as follows: The liver had rotated on its vertical axis through an angle of approximately 90 degrees; the left lobe with the characteristic omental tuberosity on its under surface was opposite the incision and covered by the suspensory ligament; the quadrate lobe, instead of being opposed to the abdominal wall between the mid and right semilunar lines, was related to the right hypochondrium between the anterior and posterior axillary lines. The author tried to rotate the liver back again to its normal position, grasping it with both hands to make the attempt, but found that it was immovably fixed in this position, nor could the gall-bladder be made to present in the incision. He therefore made a transverse incision at right angles to the first

incision back as far as the midaxillary line. The gall-bladder could then be opened in the corner of this incision, and he evacuated eighty-one small calculi. The stomach, pylorus, duodenum, and hepatic flexure of the colon seemed to occupy their normal positions, and the liver seemed to be of the size to be expected in a female patient.

Professor Arthur Keith, in a note to the author, stated that this rotation is an extreme degree of prolapse of the liver, and that it occurs only in women, and in women over 30 years of age. It is usually accompanied by evidence of visceroptosis. The right kidney in Howell's case was, however, fixed with its lower pole projecting forward under the liver. The only other evidence of visceroptosis was the gall-bladder mesentery, which was about an inch long.

P. G. SKILLERN, JR.

Fowler, R. S.: Gall-Bladder Diseases, a Progressive Inflammation; Its Treatment, Cholecystectomy. *Am. J. M. Sc.*, 1917, cliii, 497.

The author believes first, that gall-bladder disease is a progressive inflammation from its incipency; second, that its treatment is early cholecystectomy, before the disease has advanced beyond the gall-bladder. The material for the study is based upon 100 gall-bladders presenting all degrees of pathological changes.

1. Cholecystitis catarrhalis subacuta is the first stage, with the mucous membrane only slightly affected and the remainder of the walls not at all, but which present distinct microscopic appearances. Stones may be present or absent. The aspirated bile is thicker than normal and more viscid. Stronger efforts at expulsion of bile are needed and the musculature progresses to hypertrophy.

2. In cholecystitis catarrhalis chronica, externally the gall-bladder does not present evidence of inflammatory change except for the gland at the cystic duct, which is usually enlarged. Stones may or may not be present. Here and there in the mucous membrane are minute yellow bile-stained areas of destroyed epithelium. The microscopic appearance is that of mucous membrane villi, much thickened, with apices denuded of epithelium, and with the denuded areas showing macroscopically as yellow specks.

3. In cholecystitis chronica, the gross appearance shows unmistakable evidence of chronic inflammation. The entire wall of the gall-bladder is affected. The mucous membrane is lacking in most parts, being replaced by scar tissue. The musculature is markedly invaded and here and there are evidences of scar formation with contraction.

These three stages of cholecystitis catarrhalis subacuta, cholecystitis catarrhalis chronica, and cholecystitis chronica form the large proportion of cases of gall-bladder disease.

From a consideration of the above data cholecystectomy seems to be indicated in all diseases of the gall-bladder, whether causing mild or severe symptoms.

CHAS. GORDON HEYD.

Pauchet, V.: Chronic Cholecystitis (Cholecystite chronique). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 97.

Every surgeon who examines or operates on a gall-bladder must keep three pathological types before his mind in connection with it: non-calculous, simple catarrhal cholecystitis, pancreatitis, and icterus.

In Pauchet's opinion the course of a cholecystitis either calculous or not is not necessarily accompanied by an icterus. The inflammatory phenomena may be due to the cholecystitis without any calculi being present in the gall-bladder or biliary passages.

Pancreatitis often accompanies inflammation of the bile passages whether calculus is present or not.

In case of catarrhal or calculous cholecystitis, if the gall-bladder walls are altered or, if the mucosa is infected, it is necessary to remove the gall-bladder and not merely to drain it. Drainage will cause the symptoms to disappear, but they will recur when it is stopped. It should be remembered that cholecystitis often means an intestinal, hepatic, and pancreatic insufficiency, and alimentary hygiene is called for.

W. A. BRENNAN.

Porter, M. F.: Cholecystectomy; Under What Circumstances Should It Be Done? *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The author's paper is based on a study of the later literature coupled with a personal experience with about 1,000 cases of surgical diseases of the gall-bladder and gall-ducts.

The gall-bladder in man is an important though not a vital organ and should never be removed except when its removal is necessary for the cure of the patient.

It is generally agreed that gall-bladders of the following types should be removed: (1) hydrops, (2) calcareous or fibrous degeneration, (3) chronic empyema, (4) cholesterol or strawberry gall-bladder, (5) carcinoma, (6) extensive laceration and perforation, (7) gangrene of the gall-bladder—but only when it can be done without adding materially to the operative risk. Acutely infected gall-bladders with thickened walls are practically always cured by cholecystotomy. The prognostic importance of the flow of the bile into the gall-bladder at the time of operation or shortly thereafter is underestimated.

In the author's experience there has been a higher percentage of failures to secure complete cure after cholecystectomy than after cholecystotomy. Reported cases do not bear out the assumption that cholecystectomy affords any greater immunity against re-formation of stones than does cholecystotomy. Cholesterinæmia is the occasion for the return of symptoms after cholecystotomy quite often. Removal of the gall-bladder will not cure this type of case. It is illogical to remove a gall-bladder because of infection of the bile stream unless it seems clear that said infection originates from the gall-bladder itself. The difference in

morbidity following cholecystotomy as compared with that following cholecystectomy is slightly in favor of the latter operation, but this is partly due to the fact that a larger percentage of patients die, and more promptly following cholecystectomy than following cholecystotomy. The present state of knowledge does not admit of the last word being said on this subject, but the conclusion seems warranted that it is neither necessary nor advisable to remove a gall-bladder except when it is diseased or injured beyond the probability or possibility of restitution, and that this power may be presumed to be lost only when one or the other of the seven conditions above noted are present.

Meltzer, S. J.: Disturbance of the Law of Contrary Innervation as a Pathogenetic Factor in Diseases of the Bile-Ducts and the Gall-Bladder. *Am. J. M. Sc.*, 1917, cliii, 469.

The gall-bladder presents a simple mechanical device, by means of which a continuous glandular secretion is transformed into a periodic elimination.

The discharge of bile through the common duct into the duodenum occurs only periodically. During the intervals between the periods of evacuation the bile is stored in the practically quiescent gall-bladder and its periodical storage in the gall-bladder would be equivalent to a protective functional advantage. Furthermore the bile in the gall-bladder is much more concentrated than when present in the system of biliary ducts. It would seem therefore that the gall-bladder offers a means of protecting the intestines by providing for an intermittent discharge and also providing a more highly concentrated bile than that which comes from the bile capillaries.

The retention of bile in the gall-bladder represents a point of normal stasis, which may, by reason of the bacteria sometimes present in bile, bring about a pathological disorganization. The physiological quiescence of the gall-bladder harbors a pathogenetic element. However, in health, the periods of rest of the gall-bladder give rise to no pathological phenomena. The author believes that the law of contrary innervation is manifested in all functions of the animal body and that a disturbance of this law is a factor of more or less importance in the pathogenesis of many disorders and diseases of the animal body, including diseases of the gall-bladder.

Bayliss and Starling found that local stimulation of some segments of the intestine causes a contraction above and inhibition of the intestines below the stimulated parts and to this they gave the name of the law of the intestines.

Applying the mechanism of the urinary bladder and more generally the law of contrary innervation, the physiological mechanism of bile storage and bile discharge appears simple. During the storage, the muscle-fibers of the papilla of Vater are contracted and those of the gall-bladder are inhibited. During the discharge the gall-bladder contracts and Oddi's

muscle is relaxed. The bile is then ejected into the duodenum.

Bruno states that no bile appears in the duodenum so long as the stomach is empty. When a meal is taken the entrance of chyme into the duodenum causes an ejection of bile from the common duct. Rost found that after cholecystostomy the escape of bile through the papilla of Vater is indeed continuous, while in the normal animal it is always a periodic one. The author states that we may assume that by some mental excitement the tonic contraction of the sphincter of the common duct, at the period assigned for the discharge, does not become relaxed while the gall-bladder contracts within the usual normal limits, resulting in an abnormal stasis within the biliary ducts which may lead to icterus, so-called emotional icterus. Or both the muscle-fibers of the gall-bladder and of the sphincter are abnormally strongly contracted with the production of biliary colic with consecutive jaundice without either the presence of catarrhal conditions or calculi. Such conditions may be initiated or brought about by infectious diseases, particularly those that contain bacteria in the eliminated bile.

The author concludes that the law of contrary innervation plays a leading part in the mechanism of storage and discharge of bile and that a disturbance of the fine adjustment may be a pathogenetic factor in various biliary disorders.

CHAS. GORDON HEYD.

Fiolle: War Wounds of the Spleen (Quelques observations de plaies de guerre de la rate). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii.

Fiolle reports on 9 splenic wounds observed in his ambulance since 1916. Of the 9 cases, 2 were abdominal wounds and 7 were abdominal thoracic wounds; 6 recovered and 3 died.

According to Fiolle spleen injuries are not so serious in war as has been represented. Of 33 cases which have been reported to the Society of Surgery, Paris, since the beginning of the war the mortality is 66.6 per cent. The mortality in isolated splenic wounds, 6 deaths in 9 cases, is the same as in spleen wounds associated with other injuries, 12 deaths in 18 cases; but in Fiolle's personal statistics the associated wound cases show 5 recoveries in 8 cases.

Fiolle is a partisan of splenectomy in the treatment of such wounds, especially when there is rupture or extensive laceration. Technically, suture is possible for partial tears or seton wounds; but splenectomy is preferable on account of the tendency to secondary hæmorrhage. Tamponade is applicable only to wounds which are slight as regards surface, extent, and depth. Generally speaking, therefore, splenectomy is the operation of choice in war injuries of the spleen.

Regarding the route of approach, in the case of purely abdominal splenic injuries Fiolle prefers to extend the classical anterior incision in the lumbar region. Most splenic wounds are however abdom-

inothoracic and the entry wound is situated low. Duval, who submitted Fiolle's report, recommends an incision starting from the orifice wound and descending vertically or obliquely so as to cut the costal circle perpendicularly and thus become a left laparotomy directed toward the anterosuperior iliac spine. A couple of ribs are sectioned and removed and the thorax opened. Then the diaphragm is sectioned from its costal attachments to the required depth and the parietal peritoneum opened as much as is necessary. This procedure gives large access to the thorax and abdomen and allows the treatment of pleural or pulmonary lesions, if there are such, as well as abdominal lesions. The diaphragm is afterward sutured and the abdomen and thorax closed.

W. A. BRENNAN.

MISCELLANEOUS

Most: Prognosis and Treatment of Abdominal War Injuries (Zur Prognosis und Behandlung der Bauchschuesse im Kriege). *Beitr. z. klin. Chir.*, 1916, c, *Kriegschir.* H. 16, 184.

Most gives a report of 71 abdominal wounds observed at the front. Of 26 rifle bullet wounds 12 did not involve the intestine. In 2 the bladder was injured, in 2 the liver, and in 3 the pleura and diaphragm. There were 2 deaths.

Five of the wounded had slight intestinal injuries. Of these patients, four died. Of 6 cases of severe gastro-intestinal injuries all died. Altogether about 44 per cent of rifle bullet abdominal injuries recovered.

Of 3 abdominal injuries due to shrapnel bullets 2 recovered. In 5 cases of non-penetrative grenade abdominal injuries only 1 recovered. Of 4 penetrating grenade wounds of the abdomen 2 died.

There were 20 injuries of the abdomen by grenade with accompanying intestinal perforations: 6 of the small intestine, 9 of the large intestine, 1 of the small and large intestine, 1 with intestinal prolapse, and 3 with pleural and diaphragm injuries. Seven cases were operated upon and died. The non-operated cases all died. Of 7 grenade injuries involving the chest and abdominal wall without intestinal injury only 2 recovered. Both were treated conservatively.

As regards the prognosis of abdominal injuries the author concludes from his observations that as a rule rifle gunshot wounds, as well as shrapnel injuries, have a less serious prognosis than grenade and mine abdominal wounds, the prognosis of which is extremely serious, and to a great extent hopeless. There are several matters which specially influence the prognosis, comprising:

1. Concomitant gastro-intestinal canal injury. In exceptional cases small perforations may heal spontaneously, but more frequently such wounds progress to a fatal perforation peritonitis.

2. Hæmorrhages, which as a rule are so profuse as to cause death.

3. Concomitant injuries of parenchymatous organs, liver, spleen, kidney. Small, smooth, through

shots may heal. Large lacerations have a bad prognosis.

4. Infection, which is especially likely to occur in grenade and mine injuries.

5. Shock.

6. The manner and time of transportation of the wounded.

In the diagnosis of concomitant gastro-intestinal and organic injuries none of the known symptoms (facies abdominalis, faint pulse, abdominal tension, local tenderness, etc.) are distinctly specific. They can be considered of diagnostic value only. For involvement of the viscera the trajectory of the shot must be considered.

In infantry gunshot abdominal injuries, manifest symptoms of intestinal involvement is an indication for immediate surgical intervention. In doubtful cases it is advisable to wait for a few hours and examine the patient repeatedly. The time limit is from ten to twelve hours after injury by rifle shots. If the condition of the patient is then promising one can wait longer. In grenade injuries or when there is persistent hæmorrhage, Most advises operation if there is any hope of success.

In operative procedure the presumption is that laparotomy can be carried out in an efficient manner; intestinal resection should be restricted as much as possible, all dirt and blood removed, with Mikulicz tamponade and abdominal closure in layers. The after-treatment of such injuries requires very special care and observation and therefore hospitals for such cases should not be too near the front where the nursing and other conditions can never be such as is demanded for these cases.

W. A. BRENNAN.

Vital Aza, D.: Foreign Body in the Peritoneal Cavity (Cuerpo extraño en la cavidad peritoneal). *Prog. clin.*, Madrid, 1917, v, 76.

In a woman of 36 with chronic abdominal pains, who had been given various medical treatments without relief, a roentgen examination was absolutely negative. On coming to the author careful palpation showed a small movable tumor in the umbilical region. The symptoms appeared to suggest a diagnosis of suppurative ovarian cyst. On laparotomy, several loops of intestine were found intimately fused with the large omentum forming a mass adherent to the parietal peritoneum and abdominal walls. In the midst of this mass a blackish portion was found which on examination was found to contain a small encysted piece of metal. The author thinks that this having been swallowed perforated the anterior stomach wall and lodged in the large omentum, which, on inflammatory reaction, encysted it, and becoming adherent to the parietal peritoneum, ultimately formed the tumor mass felt on palpation. A similar case was reported by Nagy in 1914.

The author points out that the X-rays do not always solve problems of this kind although they are apparently simple enough to diagnose, as in the case reported.

W. A. BRENNAN.

Mercadé, S.: Congenital Diaphragmatic Hernia; Perforation of the Herniated Stomach by a Piece of Shell in the Left Thoracic Cavity (Hernie diaphragmatique congénitale; perforation par éclat d'obus de l'estomac hernié dans la cavité thoracique gauche). *Presse méd.*, 1917, p. 166.

Mercadé reports the case of a soldier with a congenital diaphragmatic hernia which had slowly evolved during 27 years without having given the least trouble. The stomach was perforated by a piece of shell which penetrated the thoracic wall at the level of the fifth rib. Although the man was wounded September 27 he survived till December 8. His chest wound, and a resulting supposed hæmothorax, evolved satisfactorily; but gastric troubles which developed could only be accounted for by supposed vagaries of the projectile. A radiograph showed a dark shadow extending from the eleventh to the seventh rib. This was attributed to the remains of the hæmothorax and pulmonary lesions. Mercadé decided that if the condition of the patient did not improve he would operate. The patient, however, sank rapidly and died within two days after the radiograph was taken. At autopsy on opening the abdomen the stomach was not found, but it was seen that the omentum was embedded under the diaphragmatic vault on the left side. There was an orifice about the width of three fingers

into the thoracic cavity through which the stomach and transverse colon penetrated. These organs were free without a sac in the left thorax. The stomach showed two perforations near the large curvature. The lung was pushed up high in the thoracic cavity. There was no sign of strangulation of the colon.

The fact that the man was a carrier of a congenital diaphragmatic hernia during his life is not exceptional; but the fact that the piece of projectile on passing through the thoracic wall met the large curvature of the stomach was unusual. The long survival after the perforation was considered remarkable. The perforation was in the large curvature at the most culminating point of the stomach. The hæmorrhage was into the stomach. The situation of the perforation did not favor evacuation of the stomach into the thorax, nor could any fluid penetrate into the abdomen because the stomach hermetically sealed the diaphragmatic orifice. Hence there was no peritoneal reaction. The author explains that as the whole of the stomach was not herniated a part of the food could reach the pylorus and undergo the action of digestive juices. Such alimentation was however very precarious. Death could only be explained by phenomena of denutrition and exhaustion as there were no other evidences to account for it.

W. A. BRENNAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Smith, M. K.: Subdeltoid Bursitis with Lime Salt Deposit. *Med. Rec.*, 1917, xci, 406.

Subdeltoid or subacromial bursitis frequently shows calcareous deposits in the supraspinatus and infraspinatus tendons in both acute and chronic cases. In all cases, conservative methods, which include rest, heat, counter-irritation, followed by easy massage and gradually increasing passive motion, should be first thoroughly tried out. If this proves a failure, and it will in but a very small percentage of cases, operative treatment may be adopted.

The author cites cases from many men, some of whom insist on operative measures if the X-ray shows shadows of lime salts, but the majority have obtained equally brilliant results with conservative treatment.

ROBERT G. PACKARD.

Walker, C. A., and Cummins, W. T.: Echinococcic Bone Disease; Report of a Case. *J. Am. M. Ass.*, 1917, lxxviii, 839.

Walker and Cummings report a case of a male Greek, 31, who for three years had severe paroxysmal pain in the upper left tibia, worse at night. At

times the leg swelled. X-ray showed a cystic condition of the tibia through its upper third.

The tibia was opened and curetted. Many cysts were found throughout the upper two-thirds of the shaft. No hooklets were found in the fluid, which was slightly yellow. The cavity was cauterized with alcohol, packed and drained.

Four months later, on account of the pain the sinus was recuretted, and five months later a radical operation was done and several more cysts found. The cavity was cleaned out with carbolic and alcohol; since then it has gradually filled in and healed over.

The authors summarize 88 cases of bone involvement by echinococcus, which they have found in the literature.

ALBERT EHRENFRIED.

Eikenbary, C. F.: Bone and Joint Lesions; a Differential Study of Six Cases. *Am. J. Orth. Surg.*, 1917, xv, 95.

In a most instructive manner the author gives the differential diagnosis of six very interesting cases. The diseases discussed are: tuberculosis of the knee, hip, and spine, sarcoma of the knee, carcinoma of the spine, suppurative retroperitoneal glands, and Perthe's disease.

It is the author's custom to insist upon a most pains-

taking history and a perfect radiograph in all cases where bone or joint lesions are suspected. Of the two — history and radiograph — he believes the history is by far the more important.

He emphasizes strongly the differential point that where pain in a bone or joint is not relieved by fixation it is probably not tubercular.

He reports two interesting cases of Perthe's disease originally diagnosed tuberculosis.

PHILIP LEWIN.

Cohn, I.: Sprains. *N. Orl. M. & S. J.*, 1917, lxix, 627.

The term sprain is used to denote a joint wrench due to sudden twist or traction, the ligaments being more or less damaged. But most often the true pathology in a case diagnosed as sprain is that of fracture or luxation, or both. Some authors even deny the existence of pure sprain but believe a sprain always a fracture, but Cohn states that in a large proportion of cases, sprains are complicated by fractures, and cites five cases of "sprains" of the knee, foot, ankle, and shoulder, that showed fracture by X-ray. Most sprains of the wrist show fracture of a carpal bone.

Sprains are infrequent as compared with other injuries about joints, and all other injuries should be ruled out before a diagnosis of sprain is made.

ROBERT G. PACKARD.

Frost, H. M.: Trench-Foot. *Boston M. & S. J.*, 1917, clxxvi, 301.

The author gives a very interesting and complete account of trench-foot. The factors which tend to produce it are: (1) cold—not enough to freeze of itself but enough to reduce the resistance of the tissues through chilling; (2) wet—accentuating the chilling effects of the cold and interfering with the circulation by causing shoes and puttees to shrink; (3) inactivity—often in cramped positions, conducive to a sluggish circulation, not only from lack of exercise but from constriction of vessels in the popliteal space. Officers are much less affected with trench-foot than privates.

Trench-foot occurs during the winter months, roughly December to March. During the winter months in 1914-15 trench-foot occurred in 17 per cent of the admissions at the American Women's War Hospital at Paignton. The winter of 1915-16 showed, however, that this number had decreased to nearly one third.

The symptoms occur after the soldiers have been on duty in the trenches for from a few hours to several days soaked with cold water up to the knees or hips. First comes numbness and cold, followed by pain and tenderness which makes walking difficult. Pain may be burning or tingling and is most marked at the points of greatest pressure, the heel and the ball of the foot; often it is rheumatic involving the toes and ankles and extending up to the knee and thigh muscles.

Clinically in the simplest type there is a discoloration, varying from a hyperæmia to a dark

red or a purple hue, usually confined to areas where greatest pressure is exerted by the shoe. Anæsthesia to the touch and pin-point confined to the areas of discoloration is common in the toes. Hyperæsthesia generally occurs in a small zone just outside the anæsthetic areas. More severe cases may be pale and the hyperæsthesia more marked with severe pain on exposure to heat or motion of the joints. Still severer cases are accompanied by œdema and bleb formation and great pain with both anæsthesia and hyperæsthesia. In these cases gangrene at times supervenes at those areas where the pressure has been most marked.

Treatment consists of elevation of feet, protection from heat, massage with oil, and sedatives. The greater part of the œdema subsides in two to three days. The simplest cases recover in about two weeks, the average in three weeks, and the most severe in from five to seven weeks. Where gangrene has occurred amputation of varying degrees is necessary, and this means being invalided out of service.

Prevention is a matter of great importance. The measure of greatest benefit seems to be a shorter period of duty in the trenches with more frequent relief. Such a thing as keeping the trenches dry is practically impossible in the first line, in the winter time. Long waterproof boots which impede the activity of the soldier are objectionable; frequent application of oil helps somewhat, but the best method is to have sufficient reserves to permit frequent relief from trench duty.

LLOYD T. BROWN.

McKnight, H. A.: Congenital Lobster-Claw Deformity. *Med. & Surg.*, 1917, i, 30.

The author reports a case of split-foot accompanied by the so-called lobster-claw deformity of the hands. The patient was a boy five years of age and one of homologous twins. The mother was normal but the father had a similar deformity involving both hands and feet. The other twin had no deformity. The child at birth presented no signs of fresh amputation scars, or evidences that the deformity was caused by intra-uterine amputation by the cord or amniotic bands. There were but two toes on each foot, separated by a deep cleft extending to the tarsal articulation. The great toe on each foot consisted of a single row of bones and was tipped by one nail, while the fourth and fifth toes were syndactylized throughout their entire length and had double nails at their extremities, and on palpation two rows of bones were revealed.

The hands presented more variability than the feet. The right hand had four fingers. The third digit was suppressed. The left hand was markedly deformed and had the typical appearance of a lobster's claw. The fifth finger was normal, the fourth thickened, and at the web seemed to be built up of two bones arranged in a triangular fashion. The second and third fingers were represented by a mass of soft tissue extending slightly beyond the normal line of the metacarpophalangeal articula-

tion. The thumb presented an irregular mass of soft tissue about 4 cm. in breadth divided on the ulnar side into 3 teat-like processes representing fingers, two of which had nails. The child was able to write, thread needles, and pick up small objects with amazing facility.

The underlying cause of these deformities is unknown. The author thinks that reduction of digits or the absence or syndactyly of digits, is not due to the absence or presence of a unit character. They must be due to inertness or suppression of some development-controlling determinant; and whether the determinant is qualitative or quantitative or consists of discrete units is unknown. Some have claimed it is due to deficiency in the central nervous system and that the nervous system shows lesions corresponding to the peripheral ones. It is rather along the lines of suppression of controlling-determinants than in the theory of a definite allelomorphic character that an explanation of these diversions of nature must be sought.

PHILIP LEWIN.

SURGERY OF THE BONES, JOINTS, ETC.

Alamartine, H.: Treatment of Complicated Gunshot Fractures of the Humeral Diaphysis (*Traitement des fractures compliquées de la diaphyse humérale par projectile de guerre*). *Lyon chir.*, 1916, xiii, 877.

The treatment of complicated gunshot fractures of the humeral diaphysis differs considerably from that of the same fractures observed in civil practice. In the two cases the lesions are very dissimilar.

In war surgery the vulnerable agents are driven by enormous force and produce special destruction. The condition of the wounded and the surgical means at disposal are also very special. These demand special methods of treatment.

The fractures are of different types:

1. Benign type, due to small projectile or projectile of reduced velocity. In this, lesion of the radial nerve is the only usual element of gravity.

2. Grave type: (a) shattering, due to small projectile with considerable velocity. The osseous lesion is extended and grave. Many spiculæ are in the region; (b) crushing, due to large projectile acting by its mass. Extensive injuries of the soft parts. The spiculæ are adherent.

3. Very severe type: Destructive crushing of the upper limb, or with complications such as gas gangrene, etc., which ordinarily call for amputation.

Treatment as far as possible should be conservative. A considerable functional restoration is compatible with extensive mutilation and even with a very defective consolidation.

Continuous extension is the best method to obtain reduction, using Delbet's apparatus. Sequestrotomies followed or not by osteosynthesis may at times be necessary. Early treatment, either at the first aid station or in the surgical ambulance, consists of wide and early surgical disinfection, removal of foreign bodies, etc.; immobiliza-

tion of the fractured limb (Delorme's thoraco-brachial splint).

Osseous interventions, sequestrotomies, etc., also continuous extension, when required, are carried out in the base hospitals.

W. A. BRENNAN:

Sénéchal: Treatment of Fractures of the Long Bones in War by Encircling Them with Wire (*Cerelage au fil métallique dans le traitement des éclatements des os longs par projectiles de guerre*). *Prog. méd.*, 1917, p. 31.

In fractures of the long bones with bad crushing of the bone, giving rise to many splinters, after cleaning the wound and removing absolutely detached bone fragments, those that are merely loosely detached from the bone are wound about with either bronze or silver wire by means of a special needle and attached along the bone in correct position. After twisting the wire the ends are drawn out through the external wound. In this way what the author calls a "bony faggot" is formed from bone chips more or less adherent in the soft tissues. Reduction of the fracture is obtained and maintained then by plaster apparatus. The author treated 66 badly crushed fractures in this way, with excellent results in all cases except 9 in which amputation was necessary. There were 5 deaths but in no case could this be in any way attributed to the wiring.

W. A. BRENNAN.

Hughes, B.: Early Treatment of Compound Fracture of the Long Bones of the Extremities. *Brit. M. J.*, 1917, i, 289.

Upon what is done for men suffering from compound fractures of the longer bones of the extremities in the hours immediately following their infliction depends to a great extent their subsequent utility, and often their life.

In the case of a man wounded in action, one must consider: (1) fatigue; (2) shock (especially in fractures involving the femur); (3) local tissue stupor; (4) infection.

Local tissue stupor is brought about in the muscles and other soft structures as a result of injury caused by a piece of shell. The naked-eye appearance of such tissue is characteristic. The muscle looks dry and lifeless, it is quite insensitive, does not bleed when cut, and does not contract when stimulated. This tissue, though not dead, is very apt to die, and while in this stunned state is very prone to infection. If a tourniquet be applied to the limb above such tissue, or if antiseptics be used, gangrene is almost certain to ensue. Under these conditions, if necessary, a limb can be amputated quite painlessly.

All shell wounds are bound to become infected, whatever care be taken. The bacteria most to be feared are: (1) bacillus perfringens, (2) Vincent's bacillus, (3) bacillus tetanus, and (4) streptococcus faecalis.

It is therefore important as early as possible to follow out the rules applying to open wounds:

(1) prevent further infection; (2) get rid, as far as possible, of infection already carried in; and, in cases of fracture, a third may be added: (3) prevent what infection has already been carried in from becoming further disseminated by thoroughly immobilizing the limb.

The author states that quite a number of wounds have become fly-blown, and that the presence of maggots in such wounds seems to exert an inhibitory action on the growth of the more virulent bacteria, and so acts beneficially. Maggots thrive only in dead tissue, and seem to hasten its removal. Two of the worst buttock wounds seen by the author became accidentally fly-blown, and from the time of the appearance of the maggots both cases began to improve.

Motor transport from the advanced dressing station to the field ambulance has, as a rule, to be as rapid as possible, owing to enemy shell fire. This necessitates shaking, and brings into prominence other complications: (1) embolism (pulmonary); (2) increased shock; (3) increased damage to tissue and so further dissemination of infection; (4) hæmorrhage. From the field ambulance these men proceed by motor to the casualty clearing station, often a considerable journey. The condition of their wounds on arrival will depend upon the length of time they have been wounded and the manner in which the fracture has been immobilized. Perfect immobilization, as early as possible, in the position in which the fractured limb is found, whether in trenches or in the open, is the first essential to success. If a limb is hopelessly shattered, with vessels and nerves divided, it is wiser to amputate at once at the regimental aid post, and tie the main vessels. Owing to tissue stupor the operation is painless, and the risk of shock and fatal hæmorrhage during transport is avoided. Tourniquets for transport should not be used. They tend to slip; they are painful, and increase shock; and they cause irretrievable damage to the tissues they constrict.

The author discusses treatment at casualty clearing stations and describes various practical splints. For the femur a rifle padded with sandbags or a great-coat is placed with the butt end in the axilla. Fractures of the humerus can be immobilized with rolled sandbags strengthened with entrenching-tool handles. Splints of special designs suitable for treatment at the casualty clearing station, and applicable to the femur, leg, humerus, and forearm, are described and illustrated.

As to the dressing, if the wound be extensive, that used for the first few days before sending these cases to the base has either been a salt pack or Carrel's tubes with Dakin's solution. The latter method requires more time, and can only be undertaken when there is not an undue rush of casualties. The salt pack has given good results, and does not require the same amount of attention.

The after-treatment is described in detail. If infection still persists in the wound, and is spreading, though not sufficiently to threaten life, treatment

will depend upon the organism present. If bacillus perfringens and streptococcus fæcalis (for these two organisms generally coexist) be the cause, then a barrier of hydrogen peroxide or potassium permanganate (strong solution) injected into sound tissue above and below the infected area, and completely encircling the limb, has done good in some cases and sufficed to arrest further spread. In a few desperate cases the author has tried intravenous injections of eusol, as recommended by Fraser and Bates, but had no success from its use.

P. G. SKILLERN, JR.

Depage and Vandervelde: Secondary Suture of the Wound in Cases of Open Fracture (De la suture secondaire de la plaie dans les cas de fractures ouvertes). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 477.

In treating open fractures in their ambulance service, by rigorously following the Carrel method after preliminary stripping and clearance of the wound, the authors have been able to sterilize wounds after a lapse of time varying from fifteen days to a month, and to definitely close them without accident. In effecting the change from an open to a closed fracture not only the time of treatment, but also that of recovery of normal function, has been shortened. The method pursued may be summed up as follows:

1. On arrival of the patient (in from two to six hours after being wounded) the fractured area is opened up, cleansed and cleared, leaving only such bone fragments as are clearly vital. Carrel tubes are then placed in position.

2. The wound is irrigated every two hours by Dakin's fluid (Carrel's prescription).

3. The dressings are renewed every day, the wound being cleaned at the same time.

4. Bacteriologic control is noted every two days. When the microbial curve remains at 0 after two or three examinations the wound is sutured.

5. Suture is effected after freshening the edges and removing any cicatricial tissue.

The authors proceeded cautiously to suture in their cases early; but since November last all fractures which have been stripped and cleared are regularly closed. They have operated upon 75 such cases.

The authors' conclusions are that an open fracture can recover aseptically. They do not know whether the Carrel method is the only one capable of giving this result, but it is the only one that has given proof of it.

W. A. BRENNAN.

Giannettasio, N.: Interscapulothoracic Amputation and the Histopathology of Primary Osseous Epithelioma (Contributo clinico all' amputazione interscapulo-toracica ed istopatologica ai tumori epiteliali primitivi delle ossa). *Polichin*, Roma, 1917, xxiv, sez. chir., 1.

Altogether there are reported in the literature about 300 cases of interscapulothoracic amputation.

Of these, 235 were for malignant tumors, 40 for severe traumatism, and the others for various morbid processes. In 165 cases of sarcoma the complete operation was not primary but had been preceded by resection of the humerus followed by a recurrence, rendering the more extensive operation necessary. Prior to 1887 the operative mortality was 29.16 per cent, dropping to 7.84 and even to 5 per cent in the years following. Only 20 genuine cases, according to the author, have survived more than five years after operation.

The details are given of two additional cases operated by the author with success, one for epithelial tumor of the scapulohumeral region, and the other for extensive traumatic lesions of the arm and shoulder.

Giannettasio thinks that the conclusions which may be deduced from published cases is that disarticulation of the shoulder for malignant tumor of the humeral head does not offer sufficient guarantee against recurrence. The number of secondary operations shows the insufficiency of this disarticulation and the necessity of resorting to a more extensive intervention. And since primary ablation of the scapula comprising with it the scapulohumeral muscles offers a better guarantee of a lasting recovery, and as the anatomical examination of recurring cases shows that most frequently these muscles are the means of spreading the malignancy, the operation of choice in malignant tumor of the upper humeral extremity is interscapulothoracic amputation.

W. A. BRENNAN.

Second, E. R.: The Operative Treatment of Coxa Vara. *Internat. J. Surg.*, 1917, xxx, 16.

"Coxa vara adolescentium or true coxa vara may be defined as a non-inflammatory softening of the neck of the femur, due to defective nutrition, and followed or accompanied by a yielding to pressure and a downward bending and torsion.

The various methods of operative treatment that have been recommended are:

1. Section of adductor muscles, with "brisement force."
2. Excision of a wedge-shaped piece of bone from the anterior surface of the femoral neck.
3. Subtrochanteric osteotomy.
4. Subtrochanteric resection of a wedge of bone.
5. Whiteman operation, in which a wedge of bone is removed from the base of the trochanter, with its apex directly facing the trochanter minor. The wedge is closed by gently abducting the limb.

Secord reports a case of a young Russian operated upon for typical double coxa vara as follows:

1. Goblet-shaped (Murphy) incision exposing the left hip-joint. The top of the trochanter, with its attached muscles, was divided by chisel and turned up.
2. Opening of the joint by incision of the capsule along the intertrochanteric line.
3. Removal of the entire lip of the acetabular rim, in front, above, and behind by chisel.

4. Wedge-shaped resection of the femoral neck, apex towards the inferior surface.

5. Abduction of the limb until the wedge was closed.

6. Insertion of the long drill through the outer surface of the femur through the femoral neck, into the cancellous tissue of the head.

7. Removal of a properly shaped graft from the tibial crest.

8. Removal of the drill and insertion of the graft in its place.

9. Suture of the capsule, replacement of the trochanter, and closure of the incision.

10. Plaster spica applied from waist to ankle, maintaining the abducted position.

The plaster was removed after six weeks and after one month more the patient was allowed to bear his weight on the limb. Four months from the date of operation he returned to his work as an iron moulder and has worked steadily ever since. He states that his leg is better than ever and he has good range of flexion and abduction.

PHILIP LEWIN.

Rouvillos, Basset, Guillaume-Louis, and Pédeprade: Treatment of Knee-Joint Wounds (*Traitement des plaies articulaires du genou*). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 86.

From June, 1915, to January, 1916, the authors treated 59 cases of penetrating wounds of the knee, by the method then generally used. After radioscopic examination of the joint it was opened by one or two lateral incisions; the foreign bodies, bone fragments, and loose tissue removed, followed by curettage of the bony parts; after lavage of the joint with an antiseptic large drains were placed in the cavity. The knee was then immobilized in plaster. Lavage was continued and the drains maintained until the fever abated and suppuration ceased. Closure of the joint and cicatrization progressed slowly, with frequent secondary accidents.

In this series of 59 cases there were 15 deaths, 9 of which occurred in the first ten days from gangrene or shock. There were 34.7 per cent of secondary interventions and 20 per cent of secondary amputations.

The study of these results shows the great frequency of infective postoperative complications necessitating secondary interventions and amputations. Besides, it is almost certain that recovery, when it does occur, is accompanied by an ankylosis.

A second series of 138 cases is also reported by the authors. In these their new method has been followed for more than a year. This consists in:

1. A complete mechanical clearance of the knee, carried out during the primary surgical intervention.
2. Closure of the joint by suture as early as possible and consequently sometimes immediately after operation, sometimes within a few days of it; thus there is an early suppression of drainage.
3. A short immobilization followed by an early mobilization, which allows the joint the maximum play of its normal functions.

Mechanical surgical clearance of the articulations is the essential part of this method. It means a fairly large excision of tissues. An antiseptic lavage is generally used in conjunction with it.

Two conditions are essential in order to effect complete mechanical clearance of the articulation, viz., it must be known before operating what lesions the joint presents and whether or not there are projectiles to be extracted; then during operation the surgeon must be able to inspect and reach the whole extent of the synovial and the articular surfaces. The first condition is sufficiently fulfilled by an X-ray examination. For the second an appropriate incision is necessary. Two principal methods of opening the joint are available: (1) the lateral patellar incision (uni- or bilateral), and (2) the arciform incision with section of the patellar ligament. While the authors have employed both they prefer the latter as it has the advantage that it gives a much larger access to all the cavity and articular surfaces than other methods which do not cut the patellar ligament.

As a general rule cicatrization occurs within eight days of the early closing of the joint. The great advantage in this is that it reduces the chances of secondary infection to a minimum. The authors have, save in rare exceptions, made the closure of the joint within the first eight days after the primary arthrotomy. It depends on the temperature and on the aspect of the tissues.

Other details of the treatment are given by the authors, as well as many illustrative cases.

As regards the results in this second series of 138 cases, 112 were treated by arthrotomy, 24 being the classic lateral and 88 arciform arthrotomy. There were 7 deaths, 5.7 per cent; 3 secondary resections, with 1 death; and 4 secondary amputations were necessary.

Of the 26 remaining cases of the 138, there were 6 primary amputations, 1 death; 7 primary resections, 1 death; and 13 cases not primarily operated upon.

As regards the functional end-results in this second series, the circumstances have rendered it impossible for the authors to follow their patients, but as far as they have been able to trace them they feel justified in stating that from all points of view, functional, vital, preservation of limb, and general conditions, the results obtained in the second series of cases are so far superior to those of the first series that they are not to be compared with them. They therefore think that in this class of case immediate intervention with a U-incision and section of the patellar ligament followed by early closure of the joint is the surgical procedure which gives the best results.

W. A. BRENNAN.

Allen, C. W.: Removal of Varicose Veins in the Leg with Local Anæsthesia. *N. Orl. M. & S. J.*, 1917, lxix, 621.

The entire vein from the saphenous opening down to the ankle is removed, including such of its tributaries as seem necessary.

Either one-fourth per cent novocaine or one-fifth per cent solution of eucaine with 2.5 drops of 1:1000 adrenalin per ounce of solution is used as an anæsthetic. About 2 ounces are used at each of the incision areas. Usually 4 points are injected through which incisions are made: one just below the saphenous opening in the fascia lata, one slightly above the knee, one just below the knee, and one just above the ankle following the course of the saphenous vein. Injections and incisions are made at right angles with the leg. All injections are made, beginning with the upper one, before any are incised. The method of injection is given in detail.

An incision is made through the upper anæsthetized area just below the saphenous opening and the vein secured, ligated proximally and divided, a stout forceps securing the distal end. The vein is enucleated with the finger, the tributaries being torn off or cut with a bistoury passed along the side of the finger. After working down as far as possible with the finger the vein is drawn taut and the second incision made over the vein. This same enucleation process is carried on until the vein is removed down to the ankle. A probe may be passed down the vein if necessary for its location.

CARL R. STEINKE.

Graham, D.: Massage in Raynaud's Disease — Dry Gangrene. *Med. Rec.*, 1917, xci, 402.

Raynaud's disease is probably a neurosis characterized by great exaggeration of the excitomotor energy of the parts of the spinal cord that control vasomotor innervation. It presents three marked phases: (1) local syncope, due to spasm of the arterioles; (2) local asphyxiation, due to consequent dilatation; and (3) dry gangrene. The disease usually attacks symmetrical parts of the body. The disease is not fatal, and recovery may be obtained before gangrene sets in. Amputation is necessary if gangrene has set in.

Some authors diagnose Raynaud's disease wherever the essential symptom-complex shows vasomotor and trophic disturbance without regard to the origin, while others diagnose Raynaud's disease only when a nervous disturbance is the cause.

Graham cites at length two interesting cases, previously diagnosed as vasomotor spasm, both of which reacted to systematic massage showing improvement of circulation, warmth, comfort, and suppleness. Not only can the vitality of the tissues be maintained and improved by means of massage, but even when destruction has begun it may be entirely recovered from. Since Raynaud's disease would seem to be capable of suddenly or gradually affecting vessels of nearly any part of the body, varied disturbances can thus be accounted for, such as sudden attacks of insanity, unconsciousness, asphyxia, hæmoglobinuria, colicky pains, or the more common "dead fingers."

ROBERT G. PACKARD.

McIlhenny, P. A.: A New French Aid in the Correction of Deformed Feet. *N. Orl. M. & S. J.*, 1917, lxi, 633.

McIlhenny has devised a new foot-wrench to take the place of the common ones which clamp the foot between metal bars or arms or knobs. This new wrench consists of a piece of oak, 14 x 2½ x 1 inches, shaped on the order of a hatchet handle. To the wider end, which has been split for 2 inches from its base, a piece of leather, 20 x 2.5 inches, is mortised in and fixed by screws. One surface of the leather is roughened and placed next to the skin to prevent slipping when the leather is wrapped around the foot. As pressure is exerted on the handle which must have its flat surface against the sole, the leather tightens, and the varus or valgus deformity is reduced without traumatizing the soft parts. An equinus may be corrected by thrusting the ankle through the split leather and applying the handle under the heel and sole, and exerting force to dorsiflex the foot.

ROBERT G. PACKARD.

Tixier, L.: Treatment of Pseudarthroses in the Suppurative Stage; Osteosynthesis by Metallic Plate and Ligature in the Suppurating Area (Du traitement des pseudarthroses à la phase de suppuration; ostéosynthèse avec plaque métallique et ligature en foyer suppuré). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 274.

Tixier points out that it has been an accepted principle in civil practice that the correct execution of an osteosynthesis by internal prosthetics calls for absolute asepsis as a primordial condition. The experimental and clinical observations of Ollier have, however, demonstrated that a certain degree of irritation of the bone by a physical, chemical, or inflammatory agent is a stimulant of osteogenesis. Besides, the author has personally demonstrated that a slight infection in the pseudarthrosed area permits a perfect consolidation in patients with delayed union.

Tixier, therefore, in cases of suppurative and fistulized pseudarthrosis has attempted their radical and operative treatment by a metallic osteosynthesis carried out under certain conditions, viz., that the suppuration is no longer warm and septic, to carefully immobilize the limb in a plaster jacket for some days until œdema, etc., have disappeared, and to drain the area when necessary.

The present report is confined to 22 cases of pseudarthroses of the humerus, although the procedure has been performed in about 40 cases including humerus, tibia, femur, and forearm.

The operation consists essentially of four parts: (1) exposure and cleaning of the fracture area; (2) drainage of the site of the osteosynthesis; (3) application of the prosthetic apparatus; (4) dressing and immobilization of the limb in a plaster apparatus.

The details of each of these stages are given in the original article.

The results of the 22 humerus osteosyntheses

show that there were 17 perfect consolidations and 5 failures. In 9 cases there was a coincident radial paralysis and in 3 of these nerve-suture was necessary, the nerve being liberated in the other 6.

Operation was executed at dates varying from four to nineteen months after injury. Except in two cases which had shown articular trouble prior to operation there has been no articular stiffness following operation or the prolonged immobilization of the limb.

Owing to the large loss of bone substance in some cases there was necessarily a great shortening in the limb, in some cases amounting to 8 cm. However, muscular adaptation and functional results were remarkable. The metal plates are not removed for four or five months.

All these cases were very severe crushed fractures and in several the patients barely escaped amputation. They now have solid and useful arms. The author says that although there is a natural repugnance on the part of surgeons to operate in the presence of pus, he thinks it necessary to draw attention to this procedure which has completely cured 17 patients without risk. W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

MacKenzie, W. C.: Observations on the Principle Governing the Early Treatment of Infantile Paralysis. *Brit. M. J.*, 1917, i, 249.

The treatment of infantile paralysis, being mainly a question of restoration of function, is dominated from the outset by anatomic considerations or, to speak more correctly, by considerations which are confirmed by a study of comparative anatomy. In this paper the question of treatment is dealt with from the point of view of (1) rest, and (2) muscular function.

It is generally conceded that this disease is an inflammatory one, and that for the treatment of inflammation rest is essential. But rest must be immediate, since, in addition to inflammation, with the possible destruction of central nerve-cells, muscle adjustments are altered as soon as the disease has begun.

As to anatomic rest of the upper and lower limbs, resting a knee by means of plaster from the mid-thigh to the mid-leg may be surgical but it is not anatomic. A tuberculous ankle is not at rest if the knee be mobile, nor is the knee unless the hip and ankle are fixed. In the upper extremity so fine and correlated are the muscular adjustments that adequate fixation of one joint is best secured by fixation of all three. The biceps is related to both the elbow and shoulder, and muscles acting on the wrist and fingers arise above the elbow-joint.

In the case of the upper limb, recumbency in bed at the outset should be insisted on. The ideal position is as follows: The thumb is adducted, owing to the importance of finger opposition, fingers slightly flexed, wrist slightly extended, hand placed mid-

way between pronation and supination, elbow slightly flexed to relieve biceps and brachialis, and the arm abducted to a right angle or even higher to help the flexors, deltoid, and trapezius.

In the case of the lower limb, it is essential at the outset even if only one limb be affected, to rest both limbs, as pelvic tilting as the result of overaction of one side easily occurs, and having once occurred is never overcome. It is also difficult at the outset to make sure whether the abdominal muscles are affected, and furthermore, only in this way can be prevented undue rotation of the hip, abduction, or adduction, to which there is so great a tendency. Hence the importance of noting the relationship of the two anterior superior spines to the umbilicus, or, more correctly, to the same plane. As regards the feet, trouble is liable to arise from deformity even after the first day, and especially foot-drop,

inversion or eversion. The method of placing the lower limb at rest is described.

Anatomically, then, the upper and lower limbs can be easily and should be immediately rested. Where these details are attended to one has gone a long way on the road to secure recovery. To failure to effect anatomic rest at the outset it had when ascribed the bad results met with in this disease.

A paralyzed limb should be handled with the greatest gentleness, and, when taken off the splint, should at first occupy the position it had when supported by the splint. The arm with a paralyzed deltoid should not be allowed to drop when taken off the splint, nor a knee be bent up, nor allowed to hang over the edge of the bed. Movement should be avoided just as carefully as in the case of a fracture of the humerus or of the femur.

P. G. SKILLERN, JR.

SURGERY OF THE NERVOUS SYSTEM

Takimoto, G.: Experimental and Clinical Investigation of Nerve-Stretching (Ueber die Nerven-dehnung, experimentelle und klinische untersuchung). *Mitt. a. d. med. Fakult. d. k. Univ. Tokyo*, 1916, xvi, 73.

The author has made an elaborate study of nerve-stretching, sketching its history from Nussbaum's first clinical demonstration in 1860 down to its present status.

The author has carried out several experiments on rabbits in the surgical clinic of the University of Tokyo; also demonstrations on some of the clinic patients. The histologic changes in a nerve after stretching are described in detail and illustrated. It appears that as the nerve is stretched the axis cylinder breaks up into segments with more or less open gaps between. This solution of the continuity of the nerve is accompanied by hæmorrhage, hyperæmia, rupture of the fibers of the connective tissue, and widening of the epineural and perineural lymph spaces. There is a degeneration of the segmental nerve-fibers.

The effect of nerve-stretching in the treatment of nerve troubles is to be explained by the foregoing results. From a theoretical standpoint the author considers that the practice has only a palliative value and that recurrences and an uncertainty as regards the results are only to be expected under the circumstances. But it may give ideal results in cases of excruciating nervous pain where all other modes of treatment fail to give relief.

Erythromelalgia is, in Takimoto's opinion, an indication for nerve-stretching, in which case not only the pain but the redness and swelling are abolished. The effect produced shows that erythromelalgia is due to an abnormal condition of the vasodilators.

W. A. BRENNAN.

Bramwell, E.: Gunshot Wounds of the Peripheral Nerves. *Med. Presse & Circ.*, 1917, ciii, 243.

To the question, "Why not operate on all these cases?" the answer is that certain effects may be due to sepsis or damaged arterial supply, and in some cases it is difficult to decide at an operation what amount of nerve should be resected and sutured. A detailed clinical investigation is necessary. The history is important. If the symptoms are not established at the same time as the wound then the nerve has not been divided. Slow onset indicates involvement of the nerve in fibrous tissue or callus. A scar indicating loss of tissue probably indicates loss of nerve, and the prospects of successful suture are not good. Palpation of the nerve at the site of injury may give information. Lack of continuity or fusiform thickening may be detected. There are no clinical signs which enable the physician to say that recovery will not take place, although there may be no power of muscular contraction. Nerve impulses may be interrupted by anatomic or histologic changes, or by physiologic interruption as the result of concussion. Suture is unwise when there are signs of regeneration. Delay does no harm. Delay is advisable when there is no breach of continuity and no neuromata. Most physicians advise that three months should elapse before a case is regarded as hopeless without operation, but some authorities delay operation longer. The different fibrils of a nerve do not regenerate at the same rate, and possibly some nerves may regenerate more quickly than others.

Complete interruption of a nerve leads to paralysis of muscles, atonia, and an abnormal degree of passive motility; the muscles waste and there are electric changes. Reaction of degeneration appears after ten days, but its appearance does not

preclude recovery, and if the muscles are treated by massage and electricity they may respond like normal muscle. The response to direct mechanical stimulation is not the same, as the tendon jerks. A tabetic with absent knee-jerks shows a strong contraction of the vastus internus when it is struck with a hammer. There is a relationship between the mechanic response and the result of electric stimulation. If faradic response persists there is response to direct stimulation; if there is galvanic response only, then the mechanic response is sluggish; if there is no galvanic response there will be no mechanic response.

Loss of sensibility is not coextensive with the branches of the nerve. The investigation of tactile sensibility and pain is sufficient for practical purposes. Trophic and vasomotor phenomena are no certain criterion of the existence of interruption. Interruption may be diagnosed by the history, by the disturbance of function and its distribution. There is no pathognomonic sign, but it is generally possible to say when there has been complete interruption at the level of the wound. In the first few weeks especially there may be no evidence of the kind of lesion, and since recovery is slow and the appearance of the nerve at operation is no guide to its condition, operation should be delayed till evidence of regeneration has had time to appear.

Regeneration is indicated by pain on pressure over the trunk below the level of the lesion, tenderness of the muscles about the third week, and tingling on pressure referred to the area supplied by the nerve. Muscular power and sensation return later. Fallacies to be noted are optimistic reports from patients, and the establishment of compensatory movements. The rapidity of regeneration is not influenced by any known factor. Degeneration may be delayed. Massage prevents muscular wasting. The value of electricity is doubtful. Questions which require an answer are: "Does electric contraction prevent or delay wasting, and, if so, for how long? Is electric stimulation without contraction any use?" There is at the present time a tendency to confuse hypotheses with facts, and to attach undue importance to the results of laboratory experiments. P. G. SKILLERN, JR.

Mantelli, C.: Syndrome of Compression of a Nerve-Trunk by Traumatic Varicose Ectasia Following a War Wound (Sindrome di compressione di un trunco nervoso da ectasia varicosa traumatica consecutiva a ferita di guerra). *Gazz. d. osp. e d. clin.*, Milano, 1917. xxxviii, 34.

The author reports a case in a man who was wounded by a bullet in the left buttock. There was no osseous lesion. The wound easily healed but intense pain developed in the leg and foot. Examination led to the diagnosis of paralysis of the left external popliteal division of the sciatic nerve. Since the symptoms were becoming aggravated the author decided to do an exploratory intervention. On incising the gluteal region in the direction of the sciatic it was seen that the trajectory of the wound

ran deeply in the gluteus maximus muscle and in one part was only a very short distance from the trunk of the sciatic. The fibers of the external popliteal division of the sciatic formed a separate trunk and were compressed by a sacciform varicose ectasia of the gluteal vein. The ectasia was about the size of a large nut and the effects of its compression of the nerve were clearly visible. This varicose dilatation was carefully dissected out.

After the operation the paralysis in the territory disappeared. Recovery was uneventful.

The finding clearly explained the symptoms and the course of the malady. It was evidently a syndrome of compression which had become slowly established owing to the gradual development of the varicose ectasia of the gluteal vein due undoubtedly to the bullet wound. The author thinks that the case is a rare example of the fact that a traumatic varicose dilatation can give rise to alterations of the neighboring nerve-trunks. He has found no record of another such case. W. A. BRENNAN.

Minervini, R.: Nerve Anastomosis Between the Median and Internal Brachial Cutaneous (Anastomosi nervosa tra mediano e brachiale cutaneo interno). *Riforma med.*, 1917, xxxiii, 284.

Plastic nerve operations, either by grafts or anastomosis, having for their object the restoration of nerve function are still comparatively rare.

The author reports a case in a man of 40 who was operated upon for the removal of a sarcomatous tumor of the internal region of the left arm. The median nerve was resected and its peripheral end anastomosed to the nervus cutaneus antibrachii medialis. Four months later restoration of function was evidently well established. Active movements of the forearm, flexion, extension, pronation, and supination, were equal to those of the right arm. Thirteen months after operation the man was working at his trade.

The author had the opportunity of removing pieces of the nerve in the vicinity of the anastomosis at an early stage. Histologic examination of these shows that the median nerve showed degeneration of the nerve-fibers in all the peripheric tract and a partial regeneration of some fibers which had passed over the cicatrix at the site of the anastomosis and undoubtedly originated from the nerve which had been anastomosed with the median, viz., the internal brachial cutaneous.

The fact of practical importance which the case brings out is, that when a surgeon finds it necessary to resect a motor or mixed nerve, and cannot for some reason anastomose it with another motor or mixed nerve, he is authorized to anastomose with a sensory nerve, because the result as in the case under consideration is satisfactory. From the practical point of view it matters little whether the sensory nerve contains motor fibers, or if there happens to be an inversion in the functions of the nerve-fibers; the fact of importance for the surgeon is that function is re-established. W. A. BRENNAN.

Chiray, M., and Roger, E.: Nerve-Sutures (Des sutures nerveuses). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1916, xl, 2149.

The authors in a long and exhaustive article point out that there is need for unanimity among neurologists regarding the classification of cases to be included in statistics of nerve-suture; also as regards the criteria of restoration. They define four classes of motor restoration: (1) lesions with no motor restoration; (2) lesions with slight motor restoration; (3) lesions with advanced motor restoration; (4) lesions with complete motor restoration. The third class includes a return of voluntary motility sufficient for the execution of movements of the paralyzed muscle with the amplitude but without the normal strength. The fourth class includes complete restoration of amplitude and motor force.

There are similar classes of electrical restoration.

The author's personal statistics comprise 56 cases of nerve-suture after total section. These 56 cases have shown: 27, or 48 per cent, of simple electrical restoration without motor restoration; 13, or 23 per cent, restorations both electrical and motor restoration; 16, or 29 per cent, results without effect.

The 23 per cent of cases of electromotor restorations can be subdivided into 14 per cent of advanced and 9 per cent of slight electromotor restorations. From the purely functional point of view there is only a slight result in about 10 per cent and a satisfactory result in about 15 per cent of the cases.

With regard to the method of intervention and the bearing it has on the result of nerve-suture: In the authors' 56 cases 49 were end-to-end sutures, 4 were nerve-grafts, and 3 were "dedoublement" cases. The 49 sutures gave 37 electrical restora-

tions and 13 motor restorations. This operation is therefore capable of assuring nerve-restoration. As the technique improves so do the results.

The 4 graft cases were autografts and gave 3 simple electrical restorations without motor return.

From their extensive investigations into the results of nerve-suturing the authors conclude:

1. Cases for suture should be selected with care and suture confined to cases of total and complete section of the nerve. As regards restorations, it is necessary to know what errors can arise in observation as thereby false conclusions may be reached regarding motor or electrical restoration.

2. From chronological reports of the different stages of electrical and motor restorations, the authors find that the first always precedes. The beginning of the reappearance of movement is, according to their experience, in about 5 months for the radial, 8 months for the cubital, 7 for the median, 2 to 5 months for the popliteal sciatic. The radial and popliteal sciatic nerves give the best results.

3. According to the authors' experience the result is the more favorable according as intervention is early. But even so operations done from the fourth to the sixth month after injury give a large proportion of successful results.

The important points in every intervention are the total resection of all fibrous tissue, the necessity of coapting without torsion, without dragging, and without crushing the nerve. End-to-end suture and grafting give equally good results.

4. The authors are convinced of the importance of postoperative care, particularly of the functional prosthesis and ionization with iodide of potassium about the operative cicatrix and the nerve-suture.

W. A. BRENNAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Gallart-Monés, F.: Clinical Value of Complement Deviation in Hydatid Cysts in General (Valeur clinique de la deviation du complément dans les kystes hydatiques en général). *Arch. d. mal. de l'appar. digest.*, 1916, ix, 148.

The clinical diagnosis of hydatid cyst has always been a difficult problem and is generally established by elimination of other pathological conditions. The author describes a method of serum diagnosis. The patient's serum is rendered inactive at 56° for half an hour. The antigen is clear liquid from human hydatid cyst. The technique is briefly described.

From his experience with 16 cases the author reaches the following conclusions:

1. The reaction is positive in 69 per cent of cases. Stern found 53 per cent positive with serum not made inactive.

2. Specific antibodies disappear from the serum about 25 to 30 days after operation.

3. The reaction of deviation has an absolute value when it is positive because it is specific.

4. There is no relation between eosinophilia and deviation of the complement because with an elevated eosinophilia specific antibodies may be lacking.

W. A. BRENNAN.

Watson, L. F.: Clinical Studies in Hyperthyroidism. *Med. Rec.*, 1917, xci, 411.

The author emphasizes the necessity of rest with dietetic and hygienic supervision, as the foundation for any treatment for hyperthyroidism, and urges that the other ductless glands as well as the thyroid

be studied in each patient; their rôle in contributing to the symptoms ascertained and treated accordingly.

Quinine and urea injections into the thyroid are suggested only to relieve the symptoms of hyperthyroidism. If acute attacks of hyperthyroidism are to be prevented, preliminary injections of sterile salt solution followed by injections of sterile water, have been found to be of value. The author believes the greatest field of usefulness for the injection will be found in those cases of beginning hyperthyroidism not severe enough to justify operative treatment, and as a preparatory measure to partial thyroidectomy in chronic cases of toxic goiter in which the patient is too ill to warrant immediate operative procedure.

BLOOD

Gettler, A. O., and Lindeman, E.: A New Method of Acidosis Therapy; Blood-Transfusion from an Alkalinized Donor. *J. Am. M. Ass.*, 1917, lxxviii, 594.

After an experimental study made on donors as to the absorption, retention, and excretion of sodium bicarbonate, the authors have submitted the following conclusions:

1. The generally accepted routine of frequent urinary analyses during the whole period of pregnancy in private cases should be supplemented by analyses of the blood, since it is a more accurate test in the determination of the condition of the patient.

2. Not only should the blood of the donor and the recipient be compatible, but also, as illustrated by this case of acidosis, in which for the first time so far as known the donor has been pre-alkalinized, the blood of the donor should be alkalinized by large doses of sodium bicarbonate before transfusion.

3. By the method of syringe transfusion we have a comparatively simple and safe method of treatment which produces results not found with other known methods.

4. The timely use of this treatment may obviate the necessity of emptying the uterus in cases of acute and severe acidosis complicated by pregnancy.

5. In alkalinizing the blood of a donor for blood-transfusion in a given case, the blood should be transfused about one-half hour after the administration of the last dose.

LUCIAN H. LANDRY.

POISONS

Miller, J.: Late Tetanus. *Brit. M. J.*, 1917, i, 223.

The case is reported of a man who was wounded October 22, 1916, by shrapnel in the posterior axillary line of the left side. He received prophylactic injection on that day and October 30. November 22 there was slight rigidity of the left arm. December 8 he was sent on leave, the wound being completely healed. December 15 he returned to duty,

and was fit and well, except for some bronchial catarrh and slight rigidity of the left arm.

January 5, 1917, he complained of pain in the head and was admitted to the hospital January 9. On the eleventh, when seen by the inspector of tetanus, he had retraction of the head, pain and stiffness in the muscles of the neck, and trismus was moderately marked. The knee-jerks were exaggerated, but there was no ankle-clonus. There was slight arching of the back and difficulty in swallowing, and persistent cough and sputum. Antitetanic serum — 3,000 units — was given intrathecally, 1,500 units intramuscularly. The injections were repeated next day. He died January 13.

Postmortem examination showed evidence of chronic alcoholism and bronchopneumonia of both lower lobes. It was agreed that death had been due to pneumonia and tetanus poisoning.

Miller states that this case emphasizes the necessity for medical officers being on the lookout for local rigidity and contraction of limbs in relation to wounds, however late these signs may be in appearing. If the rigidity is not otherwise accounted for, it is an indication for immediate antitetanic treatment.

P. G. SKILLERN, JR.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Ochsner, E. H.: The Biochemistry of Topical Applications with Special Reference to the Use of Boric Acid in Septic Infections. *Illinois M. J.*, 1917, xxxi, 139.

In the clinical experiments boric acid and lithium carbonate were used, but the results of the lithium are not given as it has no marked therapeutic action.

Before applying a saturated solution of boric acid the patient was directed to void his urine. At the end of the first hour and every two hours thereafter during the treatment he voided into clean sterile bottles, a fresh bottle being used each time. The samples were examined quantitatively and qualitatively by Prof. Kahlenberg. In every instance where saturated solution of boric acid was used as a wet dressing there was appreciable boric acid in every specimen of urine and for a varying number of hours following the use of the dressings. The amount of boric acid varied from 0.05 to 0.2 per cent each time urine was voided. With a 2 per cent aqueous solution of boric acid as a dressing very little or none was found in the urine. Ochsner thinks boric acid does not inhibit the growth of pyogenic bacteria but does reduce their virulence. This is based upon his results of injecting streptococcus pus into the peritoneal cavity of guinea pigs and mice. The pus injected in much larger quantities after the use of saturated boric acid wet dressings did not cause the death of the animal or even make it sick in some instances.

He thinks saturated solution of boric acid as a wet dressing is almost specific in streptococcus, staphylococcus albus and citreus, infection of the

skin and cellular tissue, as well as in pemphigus. It is less effective in staphylococcus aureus and entirely without value in gonorrhœa, specific inguinal adenitis, chancre, chancroid, infection caused by the *Flaschen bacillus* of Unna, in pyocyaneus infections, and in saprophytic infections; and even harmful in malignant œdema, in tuberculosis, and in impetigo contagiosa.

In order to derive the greatest amount of good from this dressing, rest, elevation of the extremity, elimination by the bowels, lungs, skin, and kidneys must be carried out. Pain must be relieved by other means than opiates. Ninety-five per cent alcohol added to the boric solution to make it 15 to 30 per cent alcohol is of great value. An area should not be incised unless there is a collection of pus and then the incision should be kept inside the limits of nature's walled off zone or distal to it. An Esmarch bandage should be applied before incising and the wound packed with gauze soaked in tincture of iodine before the bandage is removed. Time should be allowed for positive evidence of pus which gives time for a certain amount of immunity to develop.

By following the method of treatment outlined, Ochsner has usually been able to avoid incising septic infections, and in cases which came to him before incision had been practiced, he has never lost a patient, never found it necessary to amputate an extremity, not even a finger or toe, and has not one single claw-hand to his discredit.

The conclusions are: Osmosis is a purely chemical process; boric acid when applied to the surface of the body in a saturated aqueous solution is absorbed in appreciable quantities by a process of osmosis similar to the process studied in the chemical laboratory; when used in cases of septic infection, it is most potent in reducing the virulence of certain pathogenic bacteria, but, in order to be effective, it must be applied in saturated solutions; and finally, when applied as directed, in the early stages of septic infection, most cases will make complete recovery without incisions, without the loss of any member, and without permanent impairment of function.

CARL R. STEINKE.

Leyton, A. S., and H. G.: Some Streptothrixes Isolated from Tumors. *J. Pathol. & Bacteriol.*, 1916, xxi, 47.

The authors have investigated the occurrence of streptothrix in rat sarcoma and in tumors of the human being. In the case of the rat sarcoma, the authors were successful in isolating the streptothrix 11 times. Of human tumors they have examined 21, and from 16 have isolated a streptothrix. Eight failed to grow after the second generation, and 2 have since died out, so that at present they have 6 strains living and growing. Of all these one was obtained directly from the patient's blood; 11 were grown from tumors removed by operation within the preceding twenty-four hours, and 4 were isolated from postmortem room material. Nine tumors

were of mammary origin, and of the remainder, one each came from the tongue, larynx, mediastinum, gall-bladder, abdomen, cervix uteri, and skin of the foot. The cultural characteristics and morphological appearances of the streptothrix are described.

MAX KAHN.

Griffith, A. S.: An Investigation of Human Bone and Joint Tuberculosis. *J. Pathol. & Bacteriol.*, 1917, xxi, 54.

The chief purpose of this investigation of bone and joint tuberculosis was to ascertain whether or not tubercle bacilli from this variety of human tuberculosis ever diverge from the standard mammalian type in the same way as the majority of strains of tubercle bacilli from cases of lupus. A further object was to determine the frequency with which (in Great Britain) the bovine type of tubercle bacilli is the cause of tuberculosis of human bones and joints. The total number of cases investigated was 155. The cases are divided into four classes as follows:

1. Cases which yielded negative results. Material from 14 cases did not produce tuberculosis in guinea pigs. No acid fast bacilli were detected in the smears from the original material.

2. One case of multiple abscesses in the muscles. Pure cultures of tubercle bacilli were obtained from this case.

3. Cases with joint tuberculosis, but cultures isolated not from the joint lesions but from tuberculous foci in other parts of the body. There were four such cases. The bronchial gland from one case yielded culture of bovine tubercle bacilli; in the three other cases the tubercle bacillus was of the human type.

4. Cases in which cultures of tubercle bacilli were derived from tuberculous bone or joint lesions. There were 136 such cases in this series. The cultures isolated are divided into three groups: (1) standard human, (2) standard bovine, (3) atypical, i.e., not corresponding exactly either to the human or the bovine type of organism. Of the 136 cases, 107 showed the human type, 24 the bovine type, and 5 the atypical type of the organism.

MAX KAHN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Mackenzie, G. M.: The Suprarenal System and Carbohydrate Metabolism. *Arch. Int. Med.*, 1917, xix, 593.

This article by Mackenzie presents a study of the experimental data with reference to the rôle of the adrenal secretion in carbohydrate metabolism which has accumulated in the fifteen years since Blum's original observation. The work has for the most part represented efforts to discover the mechanism by which the suprarenal system, and more particularly the adrenal glands themselves, intervene in sugar metabolism, with the idea con-

stantly present that they may be implicated in the perversions of metabolism in diabetes mellitus. In addition, however, to the glycosuric effects of epinephrin injection, the author speaks of other observations which indicate that the adrenals affect the metabolism of carbohydrates.

It seems apparent from this review of the experimental work designed to clear up the problems of the relation of the adrenal secretion to glycolysis that the weight of evidence favors the view that they are unrelated. The author briefly summarizes his conclusions as follows:

1. Nervous stimuli, especially of the sympathetic, represented by piqûre or splanchnic stimulation, were followed by an increased secretion of epinephrin, and this hyperadrenalinæmia like that following epinephrin injections, caused hyperglycæmia and glycosuria in part by inhibiting glycogenesis, and in part by furthering glycogenolysis.

2. The hyperglycogenolysis thus produced was dependent partly on a direct stimulation of the liver-cells and partly on its action in rendering the receptive material between the sympathetic nerve-endings and the liver-cells more sensitive to nervous stimulation.

3. Epinephrin did not produce its effects by inhibiting glycolysis and the disturbances in sugar metabolism following its administration had little or nothing to do with the loss of glycolytic power, which was probably a part of the altered metabolism in diabetes mellitus.

4. A specific physiologic relation between the islands of Langerhans and the adrenal medulla was unproved.

5. Adrenalectomized dogs showed a diminution of the power to form glycogen from glucose.

6. Following extirpation of the adrenals in depancreatized dogs there was a rapid disappearance of hyperglycæmia.

7. Sugar administered to such animals was neither oxidized nor stored as glycogen, but appeared quantitatively in the urine. GEORGE E. BEILBY.

Shattock, S. G., and Dudgeon, L. S.: Grafting Experiments Made with Normal Mouse Tissues. Treated with Cell-Free Extract of Mouse Cancer, or Admixed with the Tumor Pulp, etc.
Proc. Roy. Soc. Med., 1917, x, Sect. Pathol., 20.

The investigations detailed in the present communication, although the results only add to the body of what may be called negative science, seemed to the authors worth recording if merely to save their needless repetition in the hands of others, and they furnish negative answers to certain questions which have presented themselves as possibilities demanding the test of experiment. The particular mouse tumor used was that known as No. 63 at the Imperial Cancer Research. One defect from which the experiments suffered was the low malignancy of this particular tumor. For while this did not detract from the value of the results arrived at by the Imperial Cancer Research, in regard to

studies in cellular immunity, it undoubtedly detracted from the experiments recorded in this communication.

The object underlying the experiments was to ascertain whether cancer-cells possessed any biological properties which would incite normal cells to participate in their purposeless or anarchical growth. For this end a cell-free extract of mouse cancer was prepared by shaking the tumor-pulp (made with the mincer) in Ringer's fluid, to which beads and fragments of glass had been added, so as to destroy the cells: the material was then lightly centrifuged in order to bring down the coarser debris. The cell-free extract, having been pipetted off, was used as a medium in which to soak the normal tissues, which were then grafted subcutaneously. That the extract was incapable *per se* of producing a tumor was shown by the fact that the centrifugalized sediment of the tumors so shaken proved to be sterile when inserted subcutaneously. Eight mice were so treated, and all with a negative result, three being killed after twenty-six days, and five, after twenty-five days. The normal tissues used were (1) mouse testicle, and (2) in order to comprise the whole group with their endocrinal interactivities, mouse embryo.

As a further and perhaps better extension of the authors' second experiment, the tumor itself was mixed with mouse embryo, the two being placed in the mincer and cut up together. Fœtal tissue of every kind was thus implanted amidst the growing elements of the tumor; the authors' object being to see whether any would be incited to grow after the manner witnessed, e.g., in the well-known malignant embryoma or "mixed tumor" of the human testicle.

The only positive result attained by the authors was limited to the persistence and some growth of the cartilage admixed with the tumor. Although the tumor with which the experiment was commenced, was subcultured fifteen times, the investigation extending over a period of nearly twelve months, and although the subcultures were "rejuvenated" on three occasions with mouse embryo, nothing of higher interest ensued; the cartilage had no sarcomatous character impressed upon it; and the very last of the fifteen subcultures presented nothing else, either macroscopically or microscopically, to distinguish it from an ordinary growth of this particular neoplasm. No visceral metastasis took place on any occasion.

The result noticed, the authors state, must itself only be regarded as an independent and transitory growth of the grafted cartilage, none of the other embryonic tissues having survived or "struck." It was of the same kind as the transitory growth of cartilage which they found to occur when minced mouse embryo, after treatment with cell-free cancer extract, was inserted beneath the skin.

In a previous communication the authors fully described the enlargement of the epiphyseal cartilage at the ends of fetal long bones isolated from

the rabbit embryo, and inserted, entire, beneath the skin of the mother, or of the unrelated adult rabbit: this, the author states, is an illustration of the vitality and power of growth possessed by cartilage under transplantation, although the limitation of the growth marks it off from what is witnessed in a proper chondroma.

Finally, in two experiments the cell-free extract was used as a subcutaneous injection immediately before the introduction of the untreated pulp of a similar tumor at the same spot. And in another experiment the extract and the pulp were mixed and inserted simultaneously. The object of this experiment was to see whether the cell-free extract would act upon the connective tissue in such a way as to induce its chemiotactic invasion by the tumor undergrowth, and so render this particular neoplasm more invasive, i.e., more malignant.

GEORGE E. BEILBY.

Shattock, S. G., and Dudgeon, L. S.: Feeding Experiments Made upon Mice, with Mouse Cancer. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Pathol.*, 35.

The first systematic attempts in this country to infect the lower animals with cancer by feeding, were those carried out by one of the authors in conjunction with C. A. Ballance. These experiments were made upon white rats, which were fed from time to time with mammary carcinoma recently excised from the human subject. As such an experiment involves a heteroplastic grafting of cells, its success from this standpoint may be open to adverse criticism.

In the present experiment, mice were fed for long periods upon mouse cancer, with results which the authors consider worthy of consideration. In a previous paper the statement was made that whether the disease (carcinoma) is infectious in the more restricted clinical sense, i. e., conveyable from one individual to a second without personal contact, is still a question that cannot yet afford to be ignored. Guelliot in an analysis of 77 cases in which a transference suggested itself, pointed out that 71 were man and wife; and 6, persons living together, masters and servants, parents, etc. In 19 of this total the disease affected similar organs, and in 58 it affected dissimilar parts, and it has been urged that the latter fact disposes of the possibility of the disease having been transferred. This is not, however, the case, the authors claim. The result can be viewed as due, not to the implantation of the living cells under such circumstances, but to the access and different distribution of a hypothetical symbiote, they say: the cell may be dead without the virus being so, or the virus may have been liberated.

In discussing the results of these feeding experiments, the authors state the first striking thing is that the tumors in the three mice have not the same histological structure; and that none can be viewed as having resulted from the growth of implanted

cells, since none repeated the histological characters of the tumor used for the purpose of feeding.

Thus, the first was a round-celled sarcoma of the mediastinal lymphatic glands and mediastinum, and of a mesenteric gland near the pancreas; the route of infection here, the author states, may have been by way of the intestine or of the respiratory track.

The second was an invasive endothelioma surrounding the lower end of the vagina, and probably arising in the inguinal extension of the mamma. And it differed from that used for the purpose of feeding, amongst other ways, in the complete absence of the necrosis which invariably occurred in the latter.

The third was an uncomplicated epithelial neoplasm of the lung arising from the alveolar epithelium.

If the results of the mouse-feeding experiments recorded in the present communication are to be interpreted on a parasitic hypothesis, the authors state, it would seem that the carcinogenic virus is freed, on the destruction of the ingested cells, and transferred after absorption, to the body of the host, wherein it incites the formation of a malignant neoplasm in some spot where the cells are prepared for its symbiosis.

GEORGE E. BEILBY.

Renton, J. M., and Robertson, M. E.: Thymusectomy and Its Relationship to Rickets. *J. Pathol. & Bacteriol.*, 1916, xxi, 1.

The author removed the thymuses in a large series of dogs and observed the results with reference to rachitic deformities. The greater number of the animals developed definite rachitic changes. They remained healthy till they were from seven to eight weeks old, when slight listlessness and lack of energy were usually first noticed. By the ninth week definite enlargement of the fore joints was usually present, and the animal began to put its whole foot to the ground instead of the toes. Gradually the joints enlarged further, the bones began to bend, and the feet assumed the extended and valgus position. When from twelve to fourteen weeks old the rickets appeared to be at its worst, and at this time many of the animals became feeble and walked with difficulty, the coat being rough and in some instances verminous; a certain number died at this period but others again showed signs of improving strength.

From a study of these operations the authors were unable to convince themselves that the removal of the thymus had any effect on the animals whatsoever. In only one case did the thymusless animal show rather more marked rachitic changes than the controls, while in two cases the operated animals remained quite healthy. In all the others the changes were present to about the same extent, and, what is more, commenced to develop at the same time, namely, when the animals were about eight to nine weeks old. The age at which the animal was operated on did not appear to make any difference in the time at which rachitic changes were first

noted. The fox terriers did not show rachitic changes until they were ninety-nine days old, and then only slightly, but this, the authors believe, must be attributed to their being less susceptible to rickets than some other breeds. One case was kept alive for 181 days, and apart from the rachitic deformities it was perfectly well when it was killed. Further, the authors noted that one control was sometimes more affected than the other, showing that there was a certain amount of individual susceptibility to rachitic changes.

As regards the nature of the changes, the authors were satisfied that they were due to the development of spontaneous rickets, and had no connection with the removal of the thymus. When it is remembered that the thymus is the only ductless gland not functioning in the mother, it may be surmised that its function may be to a large extent intra-uterine.

From their studies the authors concluded that spontaneous rickets give rise to exactly the same symptoms as Basch, Klose and Vogt, and Matti attribute to thymusctomy, with the exception of the adipose stage of Klose and Vogt.

The removal of the thymus did not make the animals more susceptible to spontaneous rickets, and if they developed it, they did so at the same time and in the same manner as the controls.

Thymusctomy of itself did not appear to cause any symptoms.

The authors are therefore of the opinion that removal of the thymus cannot be held responsible for the onset of rickets or similar bony changes, and the evidence they have obtained points to the changes which have been credited to loss of the thymus really being due to the development of spontaneous rickets in young animals.

GEORGE E. BEILBY.

Edmunds, W.: Further Observations on the Thyroid Gland. *J. Pathol. & Bacteriol.*, 1916, xxi, 23.

Edmunds has made a large number of experiments on dogs to determine the length of life after total excision of the thyroid and parathyroid glands followed by administration of calcium. The calcium was administered by putting the dog on a diet of milk only before operation. After operation the dog was kept alive on a diet of milk only with two grams of lactate of calcium a day added. Occasionally it was found the dog would live satisfactorily on this for months, but if the milk was stopped symptoms would appear; often, however, even if the milk was continued symptoms would come on early.

These dogs were treated with intravenous injections of calcium lactate, one-half to two-thirds gram. In all sixteen attempts were thus made to keep dogs alive after total excision of both thyroid and parathyroids by milk feeding, and if necessary, intravenous injections of calcium lactate, but in only six was the treatment successful, and in them it was probably necessary, as was done, to continue

the calcium feeding to prevent tremors, ataxia, convulsions, and death.

If the administration of calcium in milk by the mouth failed to keep off the symptoms, intravenous injections of the lactate of calcium were given. These were sometimes successful, and sometimes not, in preventing symptoms and death. When they were, they generally succeeded in the first three months or so, after that the animal might live for months or even years on the milk with added calcium. From this it would appear that after a time some change occurs in the animal, and this would seem to be a compensating hypertrophy of the pituitary, the author believes.

With respect to treatment, partial or complete loss of the parathyroids in thyroid operations can be treated with the parathyroid preparations now on the market, the author states. In the same way can be treated cases of disease suspected of being due to parathyroid insufficiency.

He believes that with respect to Graves's disease, there is very little evidence that the parathyroids are involved in this condition. The disease may be caused by emotion acting on the ductless glands, or by other causes; but it seems to him certain that the symptoms are caused by the secretion of the enlarged and altered thyroid, partly for the reason that similar symptoms, including exophthalmos, can be caused by the administration of thyroid preparations, but chiefly, he states, because operations for the removal of a considerable portion of the goiter are followed by the immediate and great reduction of the symptoms, often amounting to practical cure.

GEORGE E. BEILBY.

Dragstedt, L. R., Moorhead, J. J., and Burcky, F. W.: Intestinal Obstruction; an Experimental Study of the Intoxication in Closed Intestinal Loops. *J. Exp. Med.*, 1917, xxv, 421.

The authors believe that the cause of death in acute intestinal obstruction has not been determined. They point out that death is usually held to be due to toxæmia. That there are toxic substances formed in the intestine has been established. That the substances found in the lumen of the intestine in obstruction are more toxic than the substances normally present has been indicated, but, as they state, the presence of toxic substances in the blood in obstruction has not been shown, and the relation of the toxic substances in the intestine in experimental obstruction to the symptoms, and the factors involved in the production and absorption of these toxic substances are the fundamental questions in the problem of intestinal obstruction which remain unsettled, and which they have determined to throw more light upon in an extensive and carefully worked out series of experiments on dogs.

It has been demonstrated that death in experimental intestinal obstruction may occur in the absence of a systemic bacterial invasion or of peritonitis. It is probable, the authors believe, that the symptoms and death are due to a rapidly

developing toxæmia, although toxic substances have not been demonstrated in the blood in cases of experimental obstruction. As there was no excessive vomiting of fluids in their experiments the theory of dehydration of the body tissues receives no support. They were able to keep alive animals with closed loops of the duodenum and upper jejunum where bacteria had been previously removed from the loop by free drainage into the abdominal cavity. Inasmuch as the mucosa of these loops was not injured in any way, the theory of a perverted secretion of the mucosa cells induced by the condition of obstruction present in closed duodenal loops, as advocated by Whipple, appeared to the authors untenable, as did also the theory of Draper of an aberrant activity of the cells of the duodenum and the pancreas. The early theory of Draper that the toxæmia in obstruction was due to the absorption of toxic secretions of the duodenum which were normally neutralized by the juices of the intestine lower down, was disproved by the experiments with the open duodenal and jejunal loops in which these unneutralized secretions passed directly into the abdominal cavity and were absorbed, without the production of toxic symptoms.

The authors conclude that closed intestinal loops in which bacteria are first removed are compatible with life; that closed intestinal loops in which bacteria are present but in which tissue necrosis is prevented, are compatible with life; and that closed aseptic intestinal loops in which the blood supply is completely occluded are compatible with life.

The normal secretions and bacterial products of the duodenum and jejunum are not sufficiently toxic, they believe, to produce any symptoms when allowed to drain into the abdominal cavity, nor did their results support the theory of Draper of a normal toxic secretion of the duodenal mucosa neutralized by the jejunal mucosa, or the perverted secretion theory of Whipple.

Bacterial activity plus necrotic tissue, or the absorption of toxic products resulting from the action of putrefactive bacteria on necrotic tissue they present as the important factor in the rapid death in simple closed intestinal loops.

GEORGE E. BEILBY.

Whipple, G. H., and Cooke, J. V.: Proteose Intoxications and Injury of Body Protein; the Metabolism of Fasting Dogs Following Proteose Injections. *J. Exp. Med.*, 1917, xxv, 461.

In recently reported experiments the authors have pointed out that the non-protein nitrogen of the blood may show a considerable increase above normal due to intestinal obstruction or the presence of a closed intestinal loop. A definite rise in blood non-protein nitrogen may be found in association with general peritonitis or septicæmia, they state, and an acute rise can be demonstrated following an injection of a toxic proteose. They have repeatedly observed an increase of over 100 per cent non-protein nitrogen in the blood within three or four hours

following an intravenous injection of 100 to 300 mg. of purified proteose obtained from closed intestinal loops. Such an increase, they believe, can scarcely be accounted for by any kidney retention of non-protein nitrogen, and this suggested strongly that there might be a marked protein or tissue disintegration associated with proteose intoxications.

From their experiments they found that proteose injections in dogs caused vomiting, diarrhoea, temperature reactions, low blood-pressure, prostration, and, after large doses, an excess of antithrombin with incoagulable blood.

A single proteose injection, for example one-half a lethal dose, caused abrupt clinical reactions in a normal dog with apparent complete recovery within 24 to 48 hours.

The nitrogen elimination curve in a fasting dog under such conditions showed a great rise in total urinary nitrogen. The apex of the curve, they found usually fell during the second 24-hour period following the injection. This rise might be over 100 per cent increase above the mean base-line nitrogen level. It did not fall promptly to normal but declined slowly in three to five days or more toward the original base-line. This, the authors believe, speaks for a definite cell injury with destruction of considerable protein substance due to a single proteose injection. The disturbance of cell equilibrium was not rapidly or promptly restored to normal.

Dogs which had received previous proteose injections were partially immune or tolerant to subsequent injections of proteose. These dogs, as a rule, showed less intense clinical reaction and less rise in the curve of nitrogen elimination following a unit dose of standard proteose as compared with normal or non-immune controls.

The proteose used in these experiments was prepared as described by the authors from material obtained in cases of intestinal obstruction or of closed intestinal loops.

Their experiments, they believe, explain the sharp rise in blood non-protein nitrogen which follows within a few hours the injection of a toxic proteose, and also point to the correct explanation of the high non-protein nitrogen of the blood found in intestinal obstruction or with closed intestinal loops.

GEORGE E. BEILBY.

Whipple, G. H., Cooke, J. V., and Stearns, T.: Proteose Intoxications and Injury of Body Protein; the Metabolism of Dogs with Duodenal Obstruction and Isolated Loops of Intestine. *J. Exp. Med.*, 1917, xxv., 479.

The present paper deals with the reaction which develops in the dog following intestinal obstruction of a certain type or the isolation of closed intestinal loops. The authors express their belief that the intoxication associated with isolated intestinal loops and intestinal obstruction is due to the absorption from the intestinal mucosa of a toxic proteose similar to the proteose which can be isolated from the closed loops or obstructed intestine, and the experi-

ments described in this paper, they assert, give further support to this belief and add other facts which are of value for a proper understanding of the various proteose intoxications.

Dogs with isolated loops of small intestine showed many evidences of intoxication. A study of the total nitrogen elimination showed a great rise above the normal base-line minimum of the fasting period, which means, the authors state, that the intoxication is associated with a great destruction of body protein and explains the high non-protein nitrogen of the blood which they have reported on previously.

Injection of a proteose obtained from a closed intestinal loop caused a similar rise in the nitrogen elimination curve, which furnished additional evidence that the intoxication observed in association with a closed intestinal loop is in reality a proteose intoxication.

Dogs injected with sublethal doses of proteose will show a definite tolerance to subsequent injection, the authors found, and much less acute intoxication after the isolation of a closed intestinal loop. These immune or tolerant dogs showed a much less pronounced rise in the nitrogen elimination curve during proteose-intoxication of any type. This indicated to them that the tolerance or immunity to proteose gives more protection for the body proteins against the injury which these toxic proteoses inflict upon the body cells.

Complete duodenal obstruction combined with a gastrectomy gave a chronic type of intestinal obstruction associated with little vomiting, which they found peculiarly suited to metabolism study. Such duodenal obstructions showed a definite and sustained rise in the curve of nitrogen elimination above the normal base-line level. These dogs, too, were tolerant to standard toxic proteoses.

Control ether anaesthesia experiments showed little if any rise in the curve of nitrogen elimination.

Control laparotomy experiments showed a definite rise in the curve of nitrogen elimination, but a rise which was small compared with the rise noted in the intoxication of duodenal obstruction or of isolated intestinal loops. The authors consider it probable that the tissue injury and disintegration associated with the wound reaction are responsible for the general reaction, and they assume that protein split products from the wound area are absorbed and are responsible for the general reaction observed.

They are also convinced that the intoxications studied by them were associated with a definite proteose intoxication, which was capable of initiating and continuing a profound injury of tissue protein. One index of this protein injury, they point out, was the great and sustained rise in the curve of total nitrogen elimination. GEORGE E. BELBY.

Smith, G. E., and Welch, H.: Foetal Athyrosis: a Study of the Iodine Requirement of the Pregnant Sow. *J. Biol. Chem.*, 1917, Mar. 17, p. 215.

About one million hairless and otherwise defective young pigs are lost annually through stillbirth or

early death in Montana and other western and northwestern states and Canada.

The pigs are carried to term or a few days over and are born full size or larger. Absence of hair is typical; the skin is thick, pulpy, and seems oedematous but no fluid escapes on section. The hoofs are thin and brittle and the foramen ovale is constantly patent. The thyroid is enlarged and dark red or almost black. Microscopically it shows hyperplasia and vascular distention.

The thyroids of these animals were examined for the iodine content which was found to be low while the iron content was high. The author describes experiments with iodine potassium iodide, and thyroid feeding to pregnant sows and concludes:

1. An iodine deficiency during the gestation period causes a lack of function and hyperplasia of the foetal thyroid, resulting in an arrested development of the foetus.

2. If more iodine were fed to the pregnant animals in large sections of this continent, especially during the winter months, the young that they produce would be more healthy and more vigorous and the large number of weak and defective young animals that are produced annually would be greatly reduced.

Foetal athyrosis presents strong evidence that there is a relation between the physiologically active constituents of the thyroid and growth of the epidermal appendages.

An abundant secretion of the foetal thyroid among the later stages of intra-uterine life is essential for the normal development of the foetus.

K. L. VEHE.

Kendall, E. C.: Experimental Hyperthyroidism. *Tr. Am. M. Ass., Sect. General & Abdom. Surg.*, N. Y., 1917, June.

Long continued injection of amino acids into animals produces either an increased irritability with tetany and death, or a state of depression. In the urines of the dogs with tetany the percentage of the total nitrogen in the form of urea and ammonia was very low. Upon allowing the urines to stand twenty-four hours the amount of ammonia present did not change but the amount of urea increased as much as 100 per cent.

The pre-urea compound thus demonstrated appears to be the cause of the tetany. In the urine of the dogs with depression the urine showed a large amount of ammonia but no pre-urea compound.

The high percentage of ammonia and low urea appears to be the cause of the depression. The condition of the animal therefore was determined by the proper metabolism of ammonia. From what is known of adrenal cortex activity it seems probable that the adrenal cortex furnishes the mechanism for the conversion of ammonia into the pre-urea compound. Blood, liver, and adrenal tissue from a normal animal — cat, dog, guinea pig — does not act upon ammonium carbonate. After stimulation of the adrenal by fear, by electricity, and by injection

tion of ammonium carbonate, the blood, the tissues, and most of all the adrenal will convert ammonium carbonate into something not urea. While not yet proven, it seems most probable that this substance is the pre-urea compound responsible for the tetany mentioned above.

The results are interpreted as follows: The mechanism by which ammonia is supplied to the body is the thyroid hormone. Unless the adrenal cortex reacts with this, a state of depression results. The symptoms of so-called hyperthyroidism result only when there is a simultaneous stimulation of both the thyroid and the adrenal cortex. Hyperactivity of the adrenal cortex which causes an abnormally high concentration of pre-urea compound throughout the body results in tetany.

RADIOLOGY

Holland, C. T.: Radiology in Clinical Medicine and Surgery. *Brit. M. J.*, 1917, i, 285.

After giving a historic review of the development of radiology the author considers the value of X-rays in fractures, thoracic aneurism, and other conditions of the thorax, the diagnosis of urinary calculus, the investigation of the stomach and bowel by the opaque method, uses in other regions, and the limitations of X-ray diagnosis, and concludes with observations upon the teaching of radiology.

As to fractures, no case of suspected bone injury is too trivial for an X-ray examination. One may often have cause to regret that such an examination was not made early in a case; one will never regret having insisted that one should be made. It will often disclose an unsuspected condition of affairs which will influence diagnosis and treatment.

Thoracic aneurism in its early stage is discoverable by X-ray, and by X-ray alone. At the present time the examination of the chest by X-rays has become so much of a routine that aneurism can often be, and often is, detected before it has given rise to any symptoms which would suggest its presence to a physician.

As to the diagnosis of other conditions of the thorax it may be stated generally that in chest conditions of all kinds an X-ray examination is almost imperative, as frequently negative X-ray evidence is as important as a positive result. Of what use are X-rays in the diagnosis of phthisis? Every case of either definite or suspected phthisis should be subjected to an X-ray examination. In a definite case radiography will give a picture of the disease as regards the amount of lung involved, the presence of cavities or not, and their size if present, with which no other means of clinical examination can compete. Over and over again the author has seen cases in which the disease has been supposed to be limited to one lung, but in which radiography has demonstrated beyond all doubt that the other lung is also affected. It occurs not infrequently that a case is sent to the department with a note "suspected phthisis." X-ray plates show the lungs riddled with

tubercles from apex to base. One value of radiography in a definite case is that by taking plates at intervals the course of the disease can actually be seen. As illustrating the limitations of percussion, auscultation, and so on in the examination of the chest, the author cites a case in which the X-rays revealed the presence of a very large lung lesion that gave rise to no definite physical signs. Can negative X-ray evidence in early phthisis be relied upon? The author does not remember ever having known of a case in which all the X-ray signs were negative which went on to develop definite symptoms. As to the value of a radiographic examination of the thorax in the presence of malignant disease elsewhere, there is no doubt whatever that secondary deposits of malignant disease in mediastinal lymph-nodes and in the lung itself can be present without any symptoms, and without giving rise to any physical signs. There is also no doubt that a certain number of patients undergo severe operations for primary growths in whom at the time of operation there are already such secondary deposits. The time has arrived, the author believes, when it is necessary that the thorax of such patients should, as a matter of routine, be radiographed before operation. At the Cancer Hospital in London a large number of cases with malignant disease have been thus examined, and it is surprising how large a number show definite lymph-node or lung lesions secondary in character.

As to the diagnosis of urinary calculus, stones cast X-ray shadows in ratio to their density, and thus the oxalates are the easiest to show and the uric acid the most difficult. Fortunately, oxalate stones, or at any rate mixed calculi containing oxalates, are the most common, while the pure uric acid stone, except when it occurs in the urinary bladder, rarely reaches what may be termed "surgical size." Pure uric acid calculi when they do occur cannot be demonstrated by radiography, and as not altogether unfrequently they reach a large size in the bladder the negative diagnosis as regards the bladder is not reliable. In all the author's experience he has never seen a pure uric acid stone removed by operation from a kidney or a ureter, but he has occasionally seen one passed after a negative X-ray examination. It seems to be a fortunate thing that if a stone forms in a kidney or lodges in a ureter it practically never attains any considerable size without taking unto itself salts which are opaque to X-rays. The real difficulty in the radiology of this subject is not to show shadows but to interpret them: a successful radiographer is not merely a successful photographic plate taker. The negative evidence is of equal value to the positive. During the author's tenure of office at the Royal Infirmary, nearly twelve years, no stone has ever been found by operation which the radiographic department has failed to show on an X-ray plate.

As to the investigation of the stomach and bowel by the opaque meal, it has been possible by radiography to establish facts which have revolutionized

our ideas as regards the stomach and many of its disorders, which have proved beyond all doubt that the ideas previously held as to the possibility of mapping out a stomach by percussion, auscultation, etc., were absurd, and which are of the greatest diagnostic value and assistance in the direction of treatment and of surgical interference. The exact shape, size, and position of the living stomach in its natural conditions as it contains food in various amounts is disclosed by X-ray, and by X-ray alone. In the pre-X-ray days a physician, usually irrespective of any preparation of the stomach, would by means of percussion, etc., draw an outline on the abdominal wall and say, "That is the outline of the stomach." There were no means by which these results could be controlled and verified. He would be a bold man indeed who would attempt to uphold such a view now, when his outline drawings could be contrasted with the definite X-ray picture. One thing the author believes X-rays have done of the greatest importance—they have relegated that refuge of the destitute, "atonic dyspepsia," a diagnosis which has been used to cover up a multitude of sins, to the records of the past, and they have demonstrated that at any rate "chronic indigestion" is an organic condition, direct or indirect. The question of operation is often decided by the X-ray examination.

As to the limitations of X-ray diagnosis, many radiologists undoubtedly try to read too much from X-ray plates and screen examinations, and are too much inclined to overestimate the diagnostic possibilities; in this respect they have been encouraged to some extent by those who refer the cases, and who expect to have a definite opinion and diagnosis in return.

As to the teaching of radiology, the time is rapidly approaching when this subject will have to be added to the curriculum.

The more experienced one has become in the interpretation of radiographic findings the more conservative one becomes, and the more guarded in expressing dogmatic opinions.

In conclusion, the author urges each student that while he makes a point of attending the X-ray department and becomes acquainted with its routine and with the general scope of its work, he should not, especially in his student days, rely too much on this method of diagnosis to the exclusion of the development of those faculties of observation and deduction which are so important to a successful practitioner.

P. G. SKILLERN, JR.

MILITARY SURGERY

Deplas and Chevalier: Statistics of Extraction of Foreign Bodies with the Hirtz Compass in an Ambulance at the Front (Statistique d'extractions de corps étrangers au compas de Hirtz dans un ambulance fixe de première ligne). *J. de radiol.*, 1916, ii, 409.

The details are given of 153 extractions of projectiles from various regions of the body with the

aid of the Hirtz compass. In the 153 there were only 2 failures. The authors think that the ideal method is where the radiographer works strictly under surgical supervision and guidance.

W. A. BRENNAN.

Govaerts, P.: Some Clinical Indications Furnished by the Examination of the Blood After Wounds (Quelques enseignements cliniques fournis par l'examen du sang après les blessures). *Presse méd.*, 1917, p. 180.

The acute asthenia which is observed in the severely wounded and which is principally characterized by an enormous fall in the blood-pressure is in many cases due to hæmorrhage. It is important to consider this hæmorrhage carefully, to determine whether artificial serum injection will be effective or otherwise; if the anæmic condition calls for a blood transfusion or surgical intervention. The aim of the author's researches was to determine whether examination of the blood could furnish indirect indications of the extent of a recent hæmorrhage. The blood examined was obtained from recently wounded men by venous puncture in the elbow region. The results obtained appear paradoxical. In very anæmic patients without pulse there will be found a high proportion of red globules and a very marked leucocytosis, 30,000 to 50,000 white corpuscles. The author gives the results of his research into this evolution of red globules and the significance of the leucocytosis. He concludes that in the early hours after traumatism the proportion of the red globules is not in direct accord with the extent of the hæmorrhage. It seems, however, that if in the first six hours the number of red globules falls below 4,000,000 and the number of white globules is more than 30,000 there is a very serious hæmorrhage with grave prognosis. In such cases the author has seen serum injection inefficacious and transfusion clearly indicated.

If there are reasons to suspect an internal hæmorrhage, the showing of a very high leucocytosis shortly after traumatism can direct the diagnosis and indicates operation. Thus in an abdominal contusion due to a kick from a horse, seven hours later the author found reds 5,360,000, whites 31,600, and a complete rupture of the spleen was found.

In the course of treatment of a wounded patient a sudden increase in the number of red globules would indicate the presence of a peritoneal reaction or the formation of a serous effusion.

W. A. BRENNAN.

Piqué, R.: Advanced Surgical Posts (Postes chirurgicaux avancés). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 612.

Piqué expresses his conviction of the need of an advanced surgical post—a post of extreme urgency to save men who cannot endure transportation, even to the surgical ambulance. Many such men can be saved if help is brought to them and administered at once. He thinks such an advanced

post ought to be at the limit of the first line even in the position of the first-aid station and at the point where the stretcher-bearers usually transfer the wounded to automobiles. It should be installed with sufficient protection so that an operator can work in safety and the wounded who cannot be moved may be secure. There should be accommodations for twenty patients. The construction details as well as the necessary surgical and radiologic equipment are described. The personnel should consist of a complete surgical unit with orderlies.

The fundamental indication for treatment in the advanced post is shock which results from one of the three fundamental elements, inhibition, hæmorrhage, infection. Therefore, all the moribund, those with multiple wounds, lesions of chest and abdomen, hæmorrhage of the main trunks, many of whom die ordinarily before they reach a surgical ambulance or even the operating table, are cases for action in an advanced surgical post. Hæmostasis and disinfection are the main objects to be sought for in this post. Such a post is a bond between the first-aid station and the surgical ambulance and is a necessary part of surgical organization; its action is humanitarian, moral, and educative.

W. A. BRENNAN.

Rolleston, H. D.: Naval Medicine in the Great War.
Brit. M. J., 1917, i, 224.

The shore depots and training establishments have proved more liable to epidemic disease, owing to contact with the civilian population, the influx of new entries, and the massing together of youths in the boy-training establishments. Out of 274 cases of cerebrospinal fever during the first two years, 252, or 92 per cent, occurred on shore.

The general health of the men in the Grand Fleet had been extremely good. The average daily percentage of sick in the whole fleet in 1913 was 2.37 and in 1914, 2.03. Since the beginning of the war the rate in the Grand Fleet had been almost always under 1 per cent. Early in 1915 there was a severe epidemic of measles among the Shetlanders, among whom in ordinary times measles was rarely seen. Rolleston had seen a relapse of measles in a Shetlander on the twenty-eighth day of the disease — an extremely rare occurrence. No case of smallpox occurred in the fleet. Small outbreaks of enteric fever in three ships were traced respectively to infected oysters, to a carrier, and probably to contaminated water taken on board at Montreal.

In the Eastern Mediterranean Squadron during August, October, and November, 1915, almost every ship was attacked by epidemic gastro-enteritis, but the epidemic died down in December, 1915. There was a fair number of cases of typhoid, paratyphoid, and dysentery between August and the end of December, 1915. The dysentery was mainly amœbic, and in many cases associated with jaundice. The infection was probably conveyed by flies and by men returning from the beach. Sand-fly fever was prevalent in Salonica in May. No case of

beriberi had been reported. During August and September, 1915, there was an extensive epidemic of dengue at Bermuda, but the average incidence of the disease in men-of-war was 3 per cent only. Meagher's observations there supported the view that the disease is spread by mosquitoes.

The good bill of health of the fleet as a whole was due to (1) the comparative isolation of the fleets, and especially of the Grand Fleet; (2) the quarantine precautions in drafting from the shore establishments to the fleet; (3) the lectures given by the medical officers to the ships' crews on personal hygiene, dealing especially with the dangers of venereal disease and alcoholic excess (these appealed to the common sense of the men, and, as an illustration of their good effect, on the return from leave of the men (about 1,100) of one great battleship there were only three cases of gonorrhœa and one of syphilis); (4) measures — such as regattas, boxing competitions, entertainments, lectures, and cinemas — to mitigate the effects of monotony entailed by awaiting events; (5) improvement in the ventilation of the ships.

Large numbers of reserves had necessarily to be passed rapidly into the ships during the first few days of war, and a certain proportion of unfit slipped through. The incidence of sickness was therefore much higher in the Royal Naval Volunteer Reserve and Royal Naval Reserve than in the Royal Navy. Cases of failure of cardiac compensation, of relapses in pulmonary tuberculosis, and of diseases which had previously led to discharge from the service were not infrequent, and dental caries and insufficiency extremely common. Rolleston had seen ten fatal cases of malignant endocarditis and one of malignant aortitis, chiefly in reservists and pensioners. The numerous new entries, mostly quite young, provided a favorable soil for infectious diseases, such as measles, rubella, scarlet fever, mumps, and cerebrospinal fever. The effect of long-continued strain in activating latent disease, such as tuberculosis or heart-disease, was seen, and it precipitated tabes and general paralysis in some syphilitic men. Exophthalmic goiter, as during the siege of Paris and during the Boer War, seemed to have become more frequent. Over-excitation of the ductless glands might result from excitement or toxæmia due to acute infections, and while all the ductless glands might be affected it is possible that only that of the thyroid had been detected. The prolonged monotonous strain favored mental deterioration, psychasthenia, and neurasthenia, and the short interludes of acute stress and excitement might precipitate an acute breakdown with violent though transient symptoms and delusions. The effect of good morale in preventing mental disturbance was seen in the freedom of the men from these manifestations after the Jutland battle.

Burns formed at least a third of the casualties in action and fell into two groups: (1) general and severe burns due to the ignition of cordite or to burning furniture, in which destruction of the tissue was

deep, the immediate mortality high, and sepsis and deformity prone to occur; (2) burns of the skin of the face and hands due to the momentary flash of high explosives in a confined space. From instinctive closure the eye escaped, and the thinnest covering, if not inflammable, almost completely protected the skin. The new treatment by paraffin spray was now officially provided. Shock, even with slight injury, was found to be excessive. To obviate it, one-half to two-thirds grains of morphine, hypodermically, proved a sheet anchor.

In the production of "gassing" the most powerful factor was nitrous oxide. The symptoms usually came on after an uneventful interval, during which the NO and NO² were possibly oxidized to nitric acid, which accounted for the acute irritant effects on the respiratory tract. Severe headache and vomiting were followed by cough, husky voice, dyspnoea, and cyanosis, which became progressively worse, rapid respirations reaching 80 or more, restlessness, pain and tightness behind the sternum, orthopnoea, frothy, sometimes blood-stained, expectoration, and oedema of the lungs. Prophylactic treatment was quite effective, and consisted in the immediate application of a respirator containing cotton waste soaked in the usual soda solution. The treatment of the declared condition was unsatisfactory. Some benefit had been ascribed to brandy, the production of vomiting, and the repeated administration of aromatic spirits of ammonia. Rolleston had seen three cases of CO poisoning among men employed in putting out a fire in the bunkers of a collier.

Delayed pneumonia, three weeks after immersion, was noticed by Doyné in some cases after the sinking of the *Cressy*, *Pathfinder*, and *Hermes*. Appendicitis was by no means uncommon: there was a decided percentage increase directly after the battle of Jutland among the sick from the engaged ships.

The forces of the Royal Naval Division had been exposed to the same infections and diseases as the armies with which they had been associated. Diseases due to infection through the alimentary canal — diarrhoea, typhoid, paratyphoid, dysentery, and jaundice — levied a heavy toll in Gallipoli. The cause of the diarrhoea was probably flies acting as carriers in the infection of food. In dysentery, emetine and antidysenteric serum gave very satisfactory results. Emetine was freely given, and in some instances the question arose whether subsequent palpitation, breathlessness, arrhythmia, and precordial pain were due to the infection, excessive smoking, or emetine. Other bad effects of this successful drug — peripheral neuritis and chronic diarrhoea, with or without blood — were to be distinguished from recurrence of dysentery. On the other hand, it might be responsible for the rarity of hepatic abscess. Bacillary dysentery was found to be more often — in the proportion of eight to one — due to Flexner's bacillus than to Shiga's, as judged by the serological examination of convalescent

cases. Antityphoid inoculation had been fully justified by results. Much bacteriologic work was necessitated in the testing of patients sent home for intestinal diseases in order to prevent the escape of carriers into the general population. Epidemic jaundice, apparently imported from Egypt, was common in Gallipoli at the end of 1915; there was no evidence that it was due to catarrhal jaundice in epidemic form, to dysentery, or to enteric fever; the suggestion that it was due to paratyphoid fever had not been substantiated; Hurst regarded the disease as an acute infection of the duodenum, which, therefore, should be treated with the same precautions as enteric fever. A form of peripheral neuritis, clinically identical with beriberi, occurred in Gallipoli and Mesopotamia. Other fevers occurred in Gallipoli and Salonica, such as malaria, both forms of trench fever, and sandfly-fever. The value of anticholeraic inoculation and of the efforts of the Health Department at the Dardanelles, was shown by the freedom of the Royal Naval Division from cholera and plague, which were prevalent among the Turks in the immediate neighborhood. War nephritis and trench or Gallipoli sore, apparently analogous to veldt sore, and due to a gram-positive diplococcus, were also reported.

As to diseases of airmen, from leakage of petrol spray the pilot may become dizzy, and the exhaust gases from the engine — CO and CO₂ — may cause headache, drowsiness, and malaise. The rarefied atmosphere at great elevations might induce the symptoms known to balloonists. Psychasthenic symptoms — loss of self-confidence and resulting mental worry — were not uncommon, and proved that the victim had mistaken his sphere of activity. Flying is a job for a young man under 30, temperamentally and physically suitable. Perfect eyesight is necessary to effect a safe landing, perfect hearing to detect the first indications of engine defect, and free movement of the joints of the lower limbs to control the steering gear.

P. G. SKILLERN, JR.

Makins, G. H.: The Influence Exerted by the Military Experience of John Hunter on Himself and on the Military Surgeon of Today.
Brit. M. J., 1917, i, 213.

Makins thinks the divergence between Hunter's views on military surgery and those of today is not a very wide one, for although some of the most modern surgical practice has been spoken of as a revolution, yet the general tendency has rather been in the direction of a reaction. He instances the return to the direct transfusion of blood, the performance of excision of joints in the early stage of acute arthritis, the extensive operations for head injuries, and the character of the methods of wound treatment advocated by some. Even in the case of the chief triumph of recent military surgery — operations for injury of the hollow abdominal viscera — the advance has depended rather on the favorable conditions furnished by the

nature of the warfare than on any change in surgical principles.

In dealing with head injuries Hunter belonged to the active school — any injury appeared sufficient excuse for trepanning the skull. Hunter dwells on the necessity of raising a sufficiently extensive flap to allow of proper exploration of the injury to the skull, and speaks of the propriety of incising the dura mater in some instances.

The favorable prognosis attendant upon wounds of the chest is recognized, also the importance of collapse of the wounded lung in restraining primary hæmorrhage, and the tendency of the blood effused into the pleural cavity to clot.

In the section on injuries to the abdomen Hunter particularly noted the favorable course which followed the formation of a secondary fæcal abscess and fistula when the colon had been injured. In the matter of diagnosis no great advance has been made since his time, except that dependent on the use of the X-rays in localizing the seat of foreign bodies. The value of localized pain and tenderness as diagnostic aids is dwelt upon, also the various hæmorrhages as signs indicative of injury to special viscera. Again, it is interesting to note that he dwells upon the absence of any certain sign denoting injury to the spleen, also the fact that either the spleen or spleen and liver may be wounded without any obvious adverse result. The often rediscovered fact that there is little tendency for the contents to escape from a wound of the small intestine was also emphasized by Hunter. In view of the modern treatment of septic peritonitis it is instructive to note that the suggestion is made of placing the patient in a tepid bath in order to supply fluid to the general constitution.

As to amputations Hunter says, "I have already observed that few can support the consequences of the loss of a lower extremity when in full health and vigor;" hence he avoids primary amputation whenever possible, condemns operations of an intermediate nature, and prefers those of the secondary class.

As to contusions Hunter observed that the tissue devitalized by contusion temporarily protected that lying beneath, and hence the advent of inflammation (infection) was retarded — an observation which still retains its force in the case of more modern projectiles. Hunter deprecates the practice handed down from Ambroise Paré and Wiseman of routine enlargement of gunshot wounds, and ascribes its origin to anxiety on the part of the surgeon to remove a foreign body. His rule "that it should not be opened up because it is a gunshot wound, but because there is something necessary to be done which cannot be executed unless the wound is enlarged" is sound enough, as also the statement, "This is common surgery and should be military surgery respecting gunshot wounds," and is certainly to be preferred to that of Baron Percy, enunciated so late as 1792, "The first indication is to change the nature of the wound as nearly as possible into an

incised one." As to contour wounds Hunter recognized their danger and recommended an incision over the center, or the laying open of the entire track, to avoid the danger of abscess formation and the occurrence of extensive suppuration — a danger not always appreciated as it should be in dealing with contour wounds of the head, chest, and abdomen even today.

Makins devotes considerable space to a discussion of the modern methods of local treatment of wounds, including the Carrel-Dakin technique of hypochlorite sterilization, and Wright's phylacagocic or physiologic method.

As to the Hunterian ligature, Makins says that in one respect the influence exerted on military surgery by the knowledge of the ease and safety with which proximal ligature for the cure of popliteal aneurism can be performed has not been altogether good. It has encouraged the employment of proximal ligature at the seat of election for secondary hæmorrhage and even for primary bleeding from a wounded artery. Both these practices are to be condemned, except in rare instances of absolute necessity.

Makins concludes the Hunterian oration by a consideration of the opportunities of research Hunter's military life afforded him, and Makins compares them with those enjoyed by the present generation. The pathologic anatomy of the lesions produced by gunshot injury to the brain, the spinal cord, the lungs, heart, and the abdominal viscera has been worked out to an extent that will leave little to desire. New facts regarding cerebral localization and the functions of the spinal cord have been noted, while others founded on animal experiment alone have been confirmed by injuries comparable to the knife of the physiologist. Observations regarding the fevers of the field have been accumulated, an enormous practical experience of the value of the protective inoculation for enteric fevers has been acquired, while the prophylactic value of tetanus antitoxin and its influence in modifying the character of a subsequent attack has been placed beyond the region of doubt. It is not perhaps too much to expect that not only the acquisition of this extended knowledge, but also the manner of its acquisition, will exert an enduring influence upon the workers to whom we are indebted for it, and a resulting benefit will be conferred upon the community as a slight return for the misery and suffering which have been imposed upon the present generation.

P. G. SKILLERN, JR.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Necessity of Proving Which of the Possible Causes Resulted in the Injury Complained of. *Ennis vs. Banks*, 184 Pac. Rep. p. 58.

In the case of *Ennis vs. Banks*, reported in the 184 Pacific Reporter, Page 58, the Supreme Court of

Washington stated the rule in malpractice cases is that where there is more than one cause for the result complained of, the burden of proving that the result complained of was caused by the negligence charged is upon the plaintiff.

The testimony in the above case showed that on December 22, 1914, the defendant was called to the home of the plaintiff whom he found suffering from typhoid fever; the patient was removed to a hospital and was there attended by the defendant, assisted by a nurse, until January 14, following. During all of which period the patient was very ill. Gas would accumulate almost constantly in his stomach and bowels and on January 11th, after consultation with other doctors, the defendant decided that an operation was necessary to remove the gas from the stomach, but the patient's mother would not allow the operation. The patient, prior to this time, had been fed on a milk diet which did not seem to agree with him. On the 12th and 13th the patient seemed to be somewhat improved. On the 14th the doctor caused to be prepared a piece of toast, without the crust, about three inches square, which was soaked in boiling milk. An egg broken in some hot water and allowed to coagulate, was placed on the soft toast and the egg and toast given to the patient. The patient ate about two-thirds of the egg and toast and about three hours thereafter an eggnog was given. When the eggnog was administered the patient vomited the eggnog, and toast and egg which had been given about three hours before. The mother of the patient became dissatisfied and had the patient removed to her home about a block away, on a stretcher. Doctor Banks, the defendant, was dismissed from the case and a homœopathic doctor called. This doctor treated the patient for two days, the patient dying on January 16, 1915.

This action was then brought. The case was tried and a judgment rendered against the defendant for \$1,500. The defendant appealed from that judgment and the judgment was reversed and the case remanded to the trial court for re-trial. At the second trial of the case, the plaintiff succeeded in securing a judgment for \$9,000 and the case was brought to the Supreme Court of Washington where the reviewing court again reversed the case and remanded it for another trial.

The following is taken from the opinion of the Supreme Court when reversing and remanding the case after the second trial.

Whether the feeding of the toast and egg to the patient by defendant was the primary cause of his death is a question which is open to very serious doubt. The evidence showed that Mr. Ennis' death may have been the result of one of the following three causes: first the disease, itself; second, the carrying of the patient from the hospital to another place; and third, the change of diet. To which one of the above causes may be attributed the death in the above case is a question of fact and was therefore a proper question to submit to the jury for consideration, there being some testimony introduced by the plaintiff tending to show that the changing to the diet of egg and toast was improper under the circumstances. This was evidence of the specific act of negligence as charged and sufficient to take the case to the jury. The reviewing court found error in the long and voluminous instructions given to the jury and enters into a long discussion of their propriety and in conclusion says: "The issue in the case was a simple one. It ought to have been covered in, at most, a half a dozen instructions, to the points that unless the jury could say that the patient died solely from the effect of the soft toast and egg which was administered to him, and not from the disease, or from being carried from the hospital, at the stage of the disease he was then in, there could be no recovery; that there could be recovery only in case the giving of the toast and egg was the prime cause of the patient's death, and the doctor knew, or should have known, such result would follow. Before the respondent would be entitled to recover for malpractice, the jury would have to be told that they must find that Doctor Banks did not use judgment in administering the egg and toast, under the circumstances, but was guilty of malpractice in administering such egg and toast at that time." We believe that when this case is tried for the third time that, with the assistance of this opinion, together with that of the reviewing court at its previous appeal that the trial court will be so limited in the question of instructions that the plaintiff will find it practically an impossible task to have another judgment entered in favor of the plaintiff.

J. CASTAGNINO.

GYNECOLOGY

UTERUS

Vital Aza, D.: A Case of Uterine Rupture (*Un caso de ruptura uterina*). *Rev. de med. y cirug. práct.*, Madrid, 1917, xli, 65.

The author reports a case of uterine rupture in a primipara of 30 years, who came to the clinic after four days of labor. For twenty hours the infant's leg had projected through the vulva; for about twelve hours she had had no pains. The pulse was small and frequent, and she had vomited several times.

After examination uterine rupture was diagnosed and the findings led to the conclusion that primarily there had been a vertex presentation, the evolution of which had been disturbed. There was an evident tear in the uterine wall. By external and internal maneuvers the position of the foetus was changed so that by means of the forceps it was finally extracted dead.

The bad condition of the patient and the fact that she had already been chloroformed rendered it impossible to again anæsthetize her. She died four hours later without operation for rupture.

The facts elicited in the case showed that the condition was due entirely to the bungling of a so-called specialist who attended the woman and who diagnosed a vertex presentation. Extraction by forceps was tried and failed, then attempts at version were tried. A leg was drawn down and after vain attempts at extraction the woman was sent to the clinic. The rupture, which probably occurred during the manipulations, extended from the isthmus, followed the vaginal part of the neck on the left side, and involved all the uterine coats. It was 14 cm. long. The left uterine artery was injured.

W. A. BRENNAN.

ADNEXAL AND PERIUTERINE CONDITIONS

Novak, E.: Abdominal Hæmorrhage of Ovarian Origin; Report of a Case Due to Rupture of a Small Follicular Cyst. *J. Am. M. Ass.*, 1917, lxxviii, 1160.

Nelaton in 1850 described retro-uterine hæmatocele and in 1873 Gallard emphasized the importance of ectopic gestation as its cause. Since the latter date gynecologists have properly looked upon free pelvic hæmorrhage as evidence of ectopic gestation. As an exception to this general rule, however, a recent case of the author's presented severe pelvic hæmorrhage with the origin in a ruptured follicular cyst of the ovary.

The case was that of a fifteen-year-old unmarried white girl who was seized by a sudden pain in the right iliac fossa, accompanied by nausea, some vomiting, but no pain in the left side. Seven hours later

the right rectus was rigid, the pain was still localized in the right iliac fossa, and the patient was pale and prostrated; temperature 99°, and pulse 120. The only symptom discrepant from acute appendicitis was marked pallor, suggesting internal hæmorrhage from a possible ectopic sac, a possibility not supported by the patient's history or examination. Menstruation had recurred regularly every four weeks after the first year and the last period, ten days before, had been normal in amount and duration. There were no subjective symptoms of early pregnancy and rectal examination was negative except for a small anteflexed uterus. Later examinations showed a leucocytosis of 20,000 with polymorphonuclears 90 per cent, hæmoglobin 45 per cent; pulse 138; temperature 100.2° F. There was pronounced shock but no air-hunger.

Incision of the abdomen permitted the escape of a large amount of liquid blood. The left tube, otherwise normal, contained a small bluish nodule, apparently a gestation sac, which was unruptured. The fimbriated end of this tube was free and showed no hæmorrhage. Examination of the right adnexa showed the tube normal throughout and the right ovary free from adhesions but presenting an ovoid mound throughout its length, apparently a simple follicular cyst. At the summit of the mound there was an opening to which adhered a dark blood-clot. The opening and the cavity to which it led were filled with clots. The cyst walls were thin and there was no macroscopic suggestion of lutein tissue. The left ovary and appendix were normal. Though markedly shocked, the patient responded to infusions and stimulants and made an uneventful recovery.

Macroscopic and microscopic examinations excluded the possibility of the hæmorrhage coming from the ectopic sac in the tube opposite the ruptured ovarian cyst.

Survey of the literature shows a great rarity in similar cases reported, there being but forty including the author's, though many others have probably been unrecognized or not reported. These figures do not include ruptures of ovarian pregnancy or of large ovarian cysts.

Frequent cases of ovarian hæmorrhage with co-existing intra-uterine pregnancy have been reported and here the hæmorrhage has theoretically been explained by an hyperæmic engorgement of the ovary accompanying a general hyperæmia of the pregnant pelvic organs. The same explanation is suggested for two reported cases of hæmorrhage from ruptured ovaries accompanying ruptured ectopic sacs. The author's case appears unique in showing hæmorrhage from a ruptured ovary with an accompanying unruptured ectopic tube.

The causes of ovarian hæmorrhage are the same as of ovarian hæmatomata, that is, any cause of ovarian hyperæmia, active or passive, and of vascular engorgement. Practically always the bleeding is from the thecal vessels; not infrequently from the walls of atretic follicles, but more often from the walls of corpora lutea or corpus luteum cysts. If a given follicular structure were separated by only a thin membrane from the surface of the ovary, this membranous wall could be broken through by pressure of blood engorged within and free hæmorrhage into the peritoneal cavity result.

Trauma as the cause of the bleeding is reported in 9 cases; the forms include dancing, washing, compression of the ovary by the enlarging pregnant uterus, and bimanual pelvic examination, especially with the abdomen relaxed under anæsthesia.

The source of the bleeding is given as corpora lutea or corpus luteum cysts in 18 of 23 reported cases and as atretic follicles in 5 others. The author includes his own in the latter 5, because of the absence of fresh yellow lutein tissue and the lack of evidence of ovarian pregnancy.

The degree of hæmorrhage varies widely, from two tablespoonfuls to two liters. Severe hæmorrhage, in some cases resulting in death, was much more frequent.

The signs and symptoms of ovarian hæmorrhage show nothing characteristic, hence the condition is rarely diagnosed before operation. Menstrual histories, where given, show nothing of diagnostic significance in the cases reported, neither do they throw light upon the interesting query as to the phase of the menstrual cycle wherein the ovarian hæmorrhage by predilection takes place, nor, more especially, do they show if ovarian hæmorrhage bears any relation to ovulation.

In the acute or overwhelming cases the onset is sudden, with violent pain, at first local to the affected side and later spreading to the other parts of the abdomen. Nausea and vomiting are common. Right-sided hæmorrhage is therefore easily confused with appendicitis, the more so since moderate leucocytosis is the rule. The anæmia and possible air-hunger may differentiate if there is a massive internal hæmorrhage. The acceleration of the pulse is proportionate to the amount of bleeding and the accompanying shock. The temperature may be subnormal. The difficulty of exact diagnosis is made manifest by the fact that 8 of the reported cases were diagnosed appendicitis.

To differentiate extra-uterine pregnancy is perhaps even more difficult. One is misled by the sudden onset and signs of grave internal hæmorrhage. Of the reported cases, 9 were diagnosed ectopic gestation.

The above demonstrates the impossibility of precise diagnosis of ovarian hæmorrhage. It is important, however, to recall the possibility of its existence in operating upon cases of supposed acute appendicitis in women and equally important, in operating upon a supposed ruptured ectopic preg-

nancy, to recall that ovarian hæmorrhage may accurately simulate this condition. **JESSE D. COOK.**

EXTERNAL GENITALIA

Waddell, J. A.: The Pharmacology of the Vagina. *J. Pharmacol. & Exp. Therap.*, 1917, ix, 411.

The physiological studies to be found in literature, relative to the motor activities of the vagina are fairly exhaustive, while the pharmacological ones are mostly fragmentary and appear, so to speak, as appendices to the physiological. A number of authors, however, have devoted some time to the study of the question from a pharmacological standpoint, particularly Falk, for, after summarizing the uterine reactions of a series of drugs, he concludes with the comprehensive statement that all stimulants of the internal generative organs of the female affect the uterus and vagina alike.

It was the author's purpose in this paper to present the results of a study of the excised vagina of non-pregnant nulliparæ and multiparæ. Eight different species of animals included: dogs, cats, rabbits, rats, guinea pigs, cows, sheep, and hogs.

The drugs employed were epinephrin, nicotine, arecoline, physostigmine, pilocarpine, atropine, scopolamine, ergot, hydrastis, ergotoxine, morphine, cocaine, pituitary extract, and barium chloride. These were examined relative to their effects on both the longitudinal and the transverse sections of the vagina of one or all the above species.

The reactions observed were compared with those obtained by previous investigators, where data were accessible, and with the responses of the uterus of the same species. While reference in literature to the pharmacological behavior of the uterus of any particular animal was not discoverable, this was determined for the species in question in the course of the present study of the vagina.

Spontaneous rhythmic contractions were exhibited by both the circular and the longitudinal musculatures of the excised vagina of dogs, cats, rats, rabbits, guinea pigs, sheep, hogs, and cows, when suspended in oxygenated Tyrode's solution at body temperature.

The application of drugs produced on the circular musculature of the excised vagina the same response as on the longitudinal.

The excised vagina of rabbits, dogs, hogs, and sheep were stimulated by epinephrin, while those of cats, rats, guinea pigs, and cows were depressed. Accordingly, the motor sympathetic innervation was the more powerful in the former species; and the inhibitory, in the latter.

After ergotoxine, the excised vagina of the rabbit was depressed, not stimulated, by epinephrin, so that the organ in this animal possessed an inhibitory sympathetic innervation as well as a motor.

By nicotine, the excised vagina of the rabbit was stimulated and then depressed, a phenomenon which confirmed Keiffer's demonstration of ganglion cells within the wall of the organ.

Arecoline and physostigmine stimulated the excised vagina which was in agreement with Falk's conclusions as to the presence of a parasympathetic innervation.

Pilocarpine usually stimulated the excised vagina, but it at times produced depression in that of the rat.

Atropine antagonized the stimulating action of arecoline, physostigmine, and pilocarpine on the excised vagina.

Scopolamine either produced no effect or a depressant one on the excised vagina.

Ergot and hydrastis increased the amplitude of contractions but produced little change in the tone of the excised vagina.

Morphine, cocaine, pituitary extract, and barium chloride stimulated the excised vagina.

The excised vagina of the non-pregnant animal reacted to drugs in most instances, like the uterus of its species.

GEORGE E. BEILBY.

MISCELLANEOUS

Smith, H. L.: A Method of Supporting the Bladder in Certain Cases of Cystocele. *Boston M. & S. J.*, 1917, clxxvi, 591.

The author describes a method, which he believes is original with him, of supporting the bladder in certain cases of cystocele. It consists in "attaching the uterus to the posterior-inferior surface of the bladder, the cervix being sutured firmly to the posterior wall of the urethra, just below and be-

hind the meatus." As a matter of fact, as the author states in the addendum, the anterior lip of the cervix is sutured to that portion of the triangular ligament which embraces the inferior surface of the urethra. The cervix may or may not be amputated, depending upon its size, length, and contour.

By this procedure the prolapsed bladder is tucked up into the pelvis, and the bladder as a whole rests upon the anterior wall of the uterus, just as it does upon the posterior surface of the uterus in the interposition operation.

The author frankly admits that such a procedure tends to retrodisplace the uterus, but maintains that in the class of cases where this operation is indicated, viz., after the menopause, the displacement of the uterine fundus makes little or no difference.

The classes of cases in which the operation is indicated are:

1. In aged or infirm women where prolonged vaginal or abdominal operation would not be safe.
2. In cases where the uterus has been suspended or fixed but without a cure of the cystocele.
3. In cases where after supravaginal hysterectomy simple suspension of the stump of the cervix will not obliterate the "cystocele pouch."

The author has performed this operation 16 times and in every case the results have been all that could be desired, viz., obliteration of the "cystocele pouch" without the production of urinary symptoms.

HARVEY B. MATTHEWS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Faugère and Balard: Spontaneous Abortion in the Course of Severe Vomiting of Pregnancy Treated by Serotherapy (De l'avortement spontané au cours des vomissements graves de la grossesse traitées par la serothérapie). *Ann. de gynéc. et d'obst.*, 1916, xlii, 377.

Since the introduction of specific serotherapy as a treatment of severe vomiting of pregnancy many critical reports have appeared and there are still many obscure points connected with it. The method is not always a success and in some cases cessation of vomiting was coincident with the spontaneous interruption of pregnancy.

Faugère and Balard report a case in a woman of 27, a VI-para, pregnant about two months, treated by one injection of 10 ccm. of antidiphtheritic serum and four injections of 25 ccm. of hæmostyl. Abortion occurred two days after the last injection. The abortion was not due to the death of the embryo which occurred at the moment of abortion. In making an intra-uterine injection after the abortion the authors observed a thickening of the mucosa about the neck of the cervix which appeared like a lesion of cervical endometritis and was prolonged into the body of the uterus. It seems to the authors that serotherapy had no influence in producing the abortion, but that this rather resulted from the alteration of the uterine mucosa. The previous pregnancy of the patient also ended in abortion at the end of the second month. W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Beruti, J. A.: The Suppression of Pain in Physiologic Labor (La supresion del dolore en el parto fisiologica). *Semana méd.*, 1917, xxiv, 1.

The replies at length to recent communications of Cantón claiming highly favorable results from the use of his specific "partoanalga" in labor. This specific is a combination of chlorhydrate of morphine and hypophysis extract; the fundamental idea being that the hypophyseal extract would have the effect of neutralizing the paralyzing effects of morphine.

Beruti contends that such action is illusory. This he has already expressed and he now gives further reasons in support of his opinions. Clinically it has been shown that the effects of hypophysis disappear when the effects of the morphine begin to be manifested. It is not capable of reducing the toxic power of morphine. The action of the preparation "partoanalga" therefore is the action of chlorhydrate of morphine, which in large doses in physiologic labor produces intoxication. The preparation is

not therefore, as claimed by its originator Canton, innocuous; and trials of its use made by numerous colleagues have not confirmed these claims.

W. A. BRENNAN.

Johnstone, R. W.: Scopolamine and Morphine in Labor; an Experience with Seventy Cases in Private Practice. *Practitioner*, Lond., 1917, xcvi, 317.

The author's experience with twilight sleep extends over eight years; his deductions are based upon the observation of more than 200 hospital and private cases and his personal management of 70 private cases. His statistics are based upon the latter 70 cases. In the entire series he has seen much benefit and no harm to the mothers, and no babes lost.

The technique evolved from the series is as follows: First, complete the enemata and other similar disturbances to amnesia. Then, in primiparæ, inject $\frac{1}{6}$ grain of morphine and $\frac{1}{100}$ grain of scopolamine as soon as regular strong pains occur every seven to ten minutes and the external os has commenced to open. In multiparæ, use the same dosage as soon as the pains are regular and strong if the labor is expected to last at least four hours. Give a second dose of scopolamine about 45 to 50 minutes after the first, that is, before the effect of the morphia has worn off. This second dose is usually $\frac{1}{200}$ of a grain but if the patient is deeply affected by the first, it is $\frac{1}{400}$ of a grain. Thereafter sleep can be maintained by $\frac{1}{400}$ of a grain of scopolamine every hour or hour and a quarter. The author follows no rigid routine but varies dosages and their intervals according to the reaction of the individual patient to memory tests, examinations, etc. A little chloroform is administered when the head passes the perineum.

Important points in the technique are: absolute quiet throughout the entire time of treatment, darkening of the room by curtains, and unbroken attendance upon the patient by either doctor or nurse.

The 70 cases, all conducted in private homes or similar surroundings, included complications of albuminuria, cardiac disease, and minor contracted pelvis. Seventy per cent were primiparæ. There was a single breech presentation; one case in every four was an occipito-posterior presentation.

Of the 70 cases there was complete amnesia in 28 and incomplete amnesia but much analgesia in 39. With but one exception, multiparæ included in these 39 felt themselves much benefitted by the treatment. In two cases chloroform had to be substituted for the injections because of the excite-

ment produced by the latter. In one case scopolamine was quite without effect.

In but two children were there even momentary untoward results. These babes were the offspring of the same mother. One labor was much shorter than expected. In the other, a twin birth, omnipon had replaced morphine; the second twin cried at once on delivery. In both cases warm baths were effective restoratives.

The author does not believe that scopolamine increases the frequency of forceps deliveries nor does he think that it seriously prolongs the labor. He finds, however, that it tends to relax the uterus and so as a routine he injects pituitrin with the birth of the placenta. With the awakening of the patient, an hour or two after delivery, there may be moderate but temporary incoherence of thought and speech, but an extraordinary sense of well-being and an entire absence of shock or prostration.

The author always uses hypodermic tablets of scopolamine and never solutions. Although many scopolamine injections may be necessary, he rarely repeats the morphine. Morphine, the cause of oligopnoea in the child, should never be used if birth is expected in two and one-half hours, nor are the best results of the scopolamine treatment obtained if it be begun in the second stage. Morphine, which might affect the foetal heart, is not repeated by the author's technique; and hyocin, in the minimum doses recommended, is not dangerous to the foetal heart.

Amnesia only is the aim of the treatment; during the pains the patient ought to groan, talk coherently and even ask for water, which should be given her. In spite of this she will have no postpartum recollection of suffering. She should sleep in the intervals between pains but if she sleeps throughout or seems to escape all suffering, she is definitely over-dosed.

Babes after scopolamine-morphine treatment are usually sleepy and quiet for twenty-four hours; if breathing regularly, though slowly, there is no danger. For cyanosis the warm bath is most helpful. The author feels that the danger of slight degrees of cyanosis and oligopnoea is over-emphasized.

Because of the time and attention needed, the author questions whether the treatment is generally applicable to family practice; and its indiscriminate use he holds dangerous.

JESSE D. COOK.

Polak, J. O., and Matthews, H. B.: A Review of Anæsthesia in Obstetrics. *Long Island M. J.*, 1917, xi, 131.

Beginning with Sir James Y. Simpson's dictum that "pain in excess is destructive, and even ultimately fatal, and the great pain accompanying parturition is no exception to this general pathological law," the authors acknowledge that while many anæsthetics for childbirth have been tried, the ideal has not yet been found. The different obstetrical anæsthetics are discussed at length:

Ether and chloroform were first used scantily

at the birth of the head, or at the application of forceps and other similar obstetrical maneuvers, though rarely to the degree of complete unconsciousness for more difficult obstetrical operations. Next followed a period of the opposite extreme when Snow gave *chloroform à la reine* for 31 hours and others for only slightly shorter periods without death to mother or child. Still later there has been a reaction toward a less radical use of these drugs, since it is found that they have a deleterious effect upon liver and kidneys, that they predispose to postpartum hæmorrhage, that the placental transmission of chloroform is a factor in inducing hæmorrhagic disease in the newborn, and as the mother's life is jeopardized by deep or long anæsthesia, so proportionately is the child's.

The technique is as follows: Ether given by "drop method" to the desired stage of anæsthesia may be begun when the head bulges the perineum and be continued throughout the second stage.

Chloroform analgesia may be established with the beginning of each uterine contraction and the patient be permitted to regain full consciousness with the passing of the pain. So given, *chloroform à la reine* may be continued one to three hours.

Nitrous oxide and oxygen. Klickowitch, in 1880, used 80 parts of nitrous oxide and 20 parts of oxygen to produce analgesia in the late first, and entire second, stages. Three or four inhalations begun with each contraction apparently stimulated the force and increased the frequency but allayed the pain. Consciousness was not appreciably clouded and the maternal and foetal pulse were not altered. After a period of disuse the method was revived in 1907 by Webster, using 95 to 97 per cent nitrous oxide and the remainder oxygen, first for obstetrical maneuvers and minor repairs, later for cæsarean sections, and still later, by Lynch, as a routine for second-stage analgesia.

The advantages claimed are:

1. The apparatus is simple and safe.
2. It is always under absolute control and can be discontinued instantaneously.
3. The force and frequency of uterine contractions are not changed.
4. It shortens the second stage.
5. It helps relax the pelvic floor and so tends to fewer lacerations.
6. It does not predispose to postpartum hæmorrhage.
7. There is a rapid return to full consciousness.
8. There are no ill effects to mother or child.

Asphyxiation, the only danger, can be perfectly controlled by the admixture of oxygen. Thus far, no lesions of the newborn have been attributed to the method. Six hours is the maximum time for its employment so far; it is essentially a late first stage, and second stage procedure.

A standard make, new model apparatus is used assuring the essentials of thorough mixture of the gases, and even volume and pressure. A dentist's nasal inhaler wastes the least gas. Four to six deep

quick inhalations of pure nitrous oxide at the beginning of a pain suffice to produce analgesia, which may be maintained throughout the pain by admixing three to ten per cent oxygen. With the head about to pass the perineum, deeper anaesthesia may be induced. Oxygen is administered as needed to maintain good color. The ordinary cost of this method is one to two dollars an hour.

Morphine-scopolamine. These are distinctly first-stage drugs; once labor is established, they can maintain amnesia throughout the first stage without prolonging it. They do prolong the second stage and increase its danger of foetal asphyxia if this stage is much prolonged. The moderate use of either drug has no serious effect upon the mother but rather tends to reduce shock and shorten convalescence. They are most helpful in heart-disease and tuberculosis and are contra-indicated when there is doubt as to a dead child, in primary uterine inertia, or in accidents of pregnancy or labor.

The patient should be placed alone in a darkened room; her ears plugged and eyes bandaged. The first dose of $\frac{1}{4}$ grain morphia or $\frac{1}{2}$ grain narcophin and $\frac{1}{130}$ grain scopolamine (Hoffman LaRoche) is given when the cervix is the size of a quarter and regular strong pains are recurring every five minutes. Thereafter, at intervals of one hour each, two doses of scopolamine, $\frac{1}{200}$ grain and $\frac{1}{400}$ grain, respectively, are injected. Later, $\frac{1}{400}$ -grain doses are injected at two to four-hour intervals. The foetal heart must be especially watched in the second stage.

Pantopon. This is a water-soluble mixture of opium chlorides. It is about five times as active as opium. Jaeger reported 20 in which he used $\frac{1}{6}$ to $\frac{1}{3}$ grain pantopon alone, and 30 cases in which $\frac{1}{150}$ to $\frac{1}{200}$ grain scopolamine was added. Pantopon alone only decreased the sensitiveness to the pain; with scopolamine it produced complete analgesia and amnesia, i.e., twilight sleep. Conflicting opinions respectively recommend the administration of pantopon (1) when the pains have become strong and regular and (2) at the beginning of the second stage.

Advantages claimed for pantopon are:

1. It is freely water-soluble and not irritating to the subcutaneous tissues.
2. With scopolamine it produces complete analgesia and amnesia in 60 to 70 per cent of the cases.
3. It is harmless to the babe and has no unpleasant after-effects to babe or mother.
4. It is equally safe to use in either home or hospital.

Published reports indicate it to be without danger except in massive doses; these at worst induce a temporary apnoea in the babe. It is contra-indicated in primary uterine inertia or where quick delivery is desired. Relative contra-indications are: lung, circulatory, general and febrile diseases, chronic kidney disease, syphilis, and premature deliveries.

One-third grain pantopon is injected per hypo. This usually produces analgesia in 20 to 30 minutes, the more surely if $\frac{1}{150}$ grain scopolamine is added. From one to three injections may be given, the effect of each lasting from one and one-half to two hours. Smaller doses given oftener apparently give no better result.

Heroin. This produces moderate analgesia without amnesia. Between pains the patient sleeps lightly, is perfectly rational when aroused, but at once goes to sleep again.

The advantages claimed are:

1. The family physician can use it with safety in the home.
2. The second stage is shortened; there is less pain, hence greater expulsive effort.
3. It reduces postpartum shock by causing the mother to sleep.
4. It does not predispose to postpartum hæmorrhage.
5. It is absolutely harmless to the baby.

The authors recommend the drug in all uncomplicated labors as without harm to mother or child.

One-twelfth grain is injected hypodermically when pains are strong and regular; this takes away the sting of the pain in 20 minutes and its effect lasts two to three hours. A dose of $\frac{1}{24}$ to $\frac{1}{36}$ grain may be injected when the patient again feels pain; this is rarely necessary more than once or twice.

Tocanaline. Dessaignes, who introduced this drug in obstetrics, reported in 1914, 75 per cent of 112 mothers with complete amnesia, 22 per cent with partial amnesia, and 3 per cent unaffected by the drug; and of 115 newborn babes, 66 per cent cried at once, 25 per cent were apnoeic but quickly cried, 8 per cent were asphyxiated but progressed normally when made to breathe, and there was one stillbirth of a babe whose heart tones never had been heard.

The advantages claimed for tocanaline are:

1. It is less toxic than morphine.
2. It has no effect upon uterine contractions.
3. Temperature and pulse remain normal after its administration.
4. Lactation is not interfered with.
5. Involution is normal.
6. It does not predispose to postpartum hæmorrhage.
7. Versions, forceps, and perineal repairs do not require further anaesthesia.
8. Seventy-five per cent of labors are rendered painless, with no after-effects to the mother.

Its disadvantages are: it produces oligopnoea in a certain per cent of the babes; it prolongs the second stage; and should not be given if complications are likely.

Tocanaline may be given when the pains are strong and regular, and cervix dilated at least two fingers, or throughout the second stage; its administration is safe for the babe even just before birth.

The first injection is 1.5 ccm.; subsequent injections, given when the uterine contractions become painful, are from 0.5 to 0.75 ccm. From one to three injections may be given, though usually one is sufficient.

These are the authors' conclusions from the foregoing review:

1. The ideal obstetrical anæsthesia has not been discovered.

2. Prolongation of the second stage is disastrous to the child, especially if accomplished by the morphine group.

3. Certain drug combinations have definite advantages in obstetrical anæsthesia; for example, pantopon with scopolamine, or morphine with scopolamine, in the preparatory stages; and, if needed, chloroform, ether, or nitrous oxide in the perineal stage.

4. At present, morphine-scopolamine anæsthesia for the first stage and nitrous oxide gas for the second stage seem the best combinations.

5. Institutional obstetrics as a recognized specialty would seem of imperative acceptance and the judicious use of anæsthesia, though not without danger, is to be classed among obstetric arts.

JESSE D. COOK.

MISCELLANEOUS

Pryll: The Period of Conception. *Muenchen. med. Wchnschr.*, 1916, Nov.

Siegel who reported on a number of observed cases a short time ago found that the first postmenstrual week was the *optimum* period for conception. Pryll finds that the eighth day after the beginning of menstruation is the *optimum* day. The conceptive capacity of the woman rapidly falls after that time.

As regards sex Pryll finds that the old idea that in time of war there is a preponderance of male births, is verified. It is, however, not very notable, being 115 males to 106 females, an increase of 9 per cent above normal.

W. A. BRENNAN.

Belaval, J. S.: Excessive Development of the Fœtus in Primiparæ (Desarrollo excesivo del feto en primiparas). *Bol. Asoc. méd. de Puerto Rico*, 1916, xiii, 226.

The author reports 5 cases of excessive development of the fœtus in primiparæ. In these cases the weight of the fœtus varied from 11 to 13.5 pounds. There was no question of gigantism or monstrosity or deformed maternal pelvis; merely excessive development resulting in disproportion between the size of child and the maternal pelvis. In two cases the extraction was made after much difficulty with high forceps. In 2 cases version was performed with extraction. In one case cleidotomy was necessary. In 3 cases the child was delivered dead; in one case the child died shortly of cerebral compression and in one case the child lived with slight injury only manifest. Cæsarean section which was

advised in some of the cases was refused. Perineal injuries occurred in all cases and there was one maternal death.

The author thinks that where after examination the disproportion is accurately established a cæsarean operation should be done, as it offers far less danger to mother and child than any other procedure.

W. A. BRENNAN.

Slemons, J. M.: How Closely do the Wassermann Reaction and the Placental Histology Agree in the Diagnosis of Syphilis? *Am. J. M. Sc.*, 1917, cliii, 212.

Absolute diagnosis of syphilis is made upon the demonstration of the spirochæta pallida. This organism is readily demonstrated in the placenta in approximately every third case of syphilis.

The most trustworthy evidences of placental syphilis are the histological changes in the chorionic villi. The syphilitic villi appear in the fresh specimen abnormally large, opaque, and irregular in shape, with swollen ends. Stained sections show that the pathological process begins as a proliferative inflammation in the walls of the smallest blood-vessels. The lumen of the vessel may be obliterated. The enlargement of the villi is the result of the proliferation of the stroma. At last the syncytium which covers the villi proliferates and invades the underlying tissue.

While the changes in the villi constitute the most distinctive evidence of placental syphilis they have not been accepted by everyone as pathognomonic.

The author examined the placenta in 360 consecutive cases and controlled his findings by the Wassermann reaction in the mother's blood.

Group	Wasserman	Placenta	Number of Cases
1	Negative	Negative	336
2	Positive	Positive	10
3	Negative	Positive	1
4	Positive	Negative	14

Groups 1 and 2 comprise 95 per cent of the cases. The single case in group 3 was undoubtedly syphilitic. In only two of the cases in Group 4 was the reaction strongly positive (+++). In one of these there was a streptococcic infection which probably accounted for the reaction. In another the syphilitic infection occurred one month after pregnancy occurred. In the other twelve only a faintly positive reaction was obtained. Of these patients, ten were suffering from eclampsia or toxæmia of pregnancy with albuminuria.

A suggestive or a positive Wassermann has been found in cases of eclampsia by other observers. There seems to be no relation between the Wassermann reaction and the cholesterol content of the blood.

If these weakly positive reactions, which should not be taken to indicate syphilis, be excluded, the serological test and the placental examination agree 99 times out of 100.

S. A. CHALFANT.

GENITO-URINARY SURGERY

KIDNEY, ADRENAL, AND URETER

Bolognesi, G.: The Formation of Calcareous Infarcts in the Kidney (*La formation des infarctus calcaires dans le rein*). *J. d'uro.*, 1914, vi, 639.

Deposits of phosphates and carbonates of lime in the renal parenchyma are inaptly termed calcareous infarcts. They are most frequently met with in old patients and in osteomalacia, fibrous osteitis, etc., in which the process may be considered as a calcareous metastasis.

Experimentally, calcareous infarct has been obtained by general intoxication with many substances, bismuth, phosphorus, oxalic acid, etc.

In the anatomico-pathological institute of Bologna the method of experimentation has been by injection of different chemical substances directly into the renal parenchyma. In this way the author has experimented with several well-known antiseptics, lysol, phenol, cresol, etc. The experiments were made in rabbits and without surgical intervention; the injection being made by means of a Pravaz syringe into the kidney after passing through the intermediate tissue. About 1 ccm. was usually injected.

Bolognesi gives the details of ten such experiments. His results show that lysol, phenol, and cresol solution are capable of producing calcareous infarcts when directly injected into the renal tissue. These substances on direct contact with the kidney tissue cause fatty degeneration and constantly produce a special type of renal necrosis followed by infiltration of lime salts. It is most frequently seen under the form of granular interstitial infiltration. The formation of infarcts commences about twelve hours after the injection. Some epithelial cells appear at this time at the site of the injection. If these are progressively examined for several days, a fusion of the cells will be observed, an amorphous mass forming, having all the reaction of lime salts.

W. A. BRENNAN.

Braasch, W. F.: Clinical Data of Nephrolithiasis. *Surg., Gynec. & Obst.*, 1917, xxiv, 8.

The author reviews the clinical data from 484 operations for nephrolithiasis performed on 450 patients.

As to the identification of shadows in the roentgenogram the mistakes are principally of two types: (1) error in interpretation, and (2) failure to show the stone shadow. Errors in interpretation have been largely eliminated through the aid derived from the cystoscope and particularly from pyelography.

If the stone is situated in the pelvis the shadow may be obscured by the pelvic outline and the

exact position can be determined only by comparing the pyelogram with the original roentgenogram. Frequently, however, the outline of the stone is visible through that of the pelvis. When the stone is situated in a calyx, its outline may be seen through that of the calyx which is usually characterized by definite deformity. When the stone is in a calyx, the comparative size of the calyx may be ascertained and this may be of value in determining the possibility of removing the stone through the pelvis. When the stone is situated partially in a calyx and partially in the cortex, its outline may be seen extending beyond that of the calyx. When situated in the cortex, the stone may be seen clear of the pelvic outline.

The situation of the stones was as follows: 180 in the pelvis; 14 in the pelvis and calyces; 12 in the pelvis and cortex; 20 in the calyces; 48 in the cortex; and 8 at the ureteropelvic juncture.

Renal stone was found to be single in 285 operations and multiple in 188.

As to the coincidence of stones in the kidney and ureter, a stone was found in the ureter and the kidney on the same side in 26 patients, 5.7 per cent. This is of interest as it indicates the necessity of plates showing both the kidney and the entire ureter.

If on cystoscopic examination, it is found advisable to save the kidney, it is usually well to remove the ureteral stone first. When the function of the kidney is largely destroyed, nephrectomy is indicated as the primary procedure.

Seventy-six stones were described as being distinctly branched. Counting only operations other than nephrectomy where exact localization was not possible, the stone was found in the pelvis and calyces in 22 cases and in the substance of the kidney in 14. It is evident, therefore, that branched stones are found more frequently in the pelvis and calyces than in the cortex.

The bilateral occurrence of stone was noted in 48 patients, 9.9 per cent of the total number operated on.

Previous operations. Of the total number, 143 patients, or practically one-third had previous laparotomies performed elsewhere for relief of pain. Of this number, 83 had stone in the right kidney, 55 stone in the left kidney, and 5 bilateral stone. It is evident that laparotomy was performed more frequently for stone in the right kidney than for stone in the left. It is of interest that 21 of the patients with stone in the left kidney had had previous operations on the appendix or gall-bladder.

Fifty-three of the patients gave a definite history and 14 a somewhat questionable history of having passed stone from the kidney prior to the operation.

Eight described the pain at the time of passing the stone as being on the side opposite the kidney operated upon. Seven patients evidently had passed stones from both kidneys.

The operations performed were divided as follows: nephrectomy in 188 cases; nephrolithotomy in 40; combined pelviolithotomy and nephrolithotomy in 34.

As nearly as could be ascertained, the total number of patients who have died since the operation is 35. Of this number 3 died in the hospital because of the operation, an operative mortality of 0.6 per cent.

As to the postoperative results, complete clinical data including X-ray, urinalysis, etc., were obtained for 88 patients previously operated upon for renal stone who returned to the clinic for re-examination. Of these 88 patients, 13, or 14.7 per cent, had recurrence. This percentage of recurrences, however, is manifestly higher than that in all patients operated on, since nearly all of those re-examined had sufficiently definite symptoms to cause their return. Of the 13 patients in whom a recurrence was found, 11 were reoperated on. In every case but one, the stones recurred in the same portion of the kidney as at the primary operation.

Taking into account the number of patients whose X-ray examinations were positive, 13; those with positive symptoms and urinalysis, 15; and those with a history of having passed stones after operation, 18; we have a total of 46 patients, or 9.8 per cent, who may be regarded as having had recurrence of stone.

V. D. LESPINASSE.

Martin, H. H., and Mertz, H. O.: Tumors of the Kidney and Stone; Report of a Case of Primary Alveolar Carcinoma of the Pelvis Associated with Multiple Stone. *Miss. Valley M. J.*, 1917, xxiv, 75.

In an exhaustive study of the literature in regard to the formation of carcinoma secondary to stone in the kidney, the authors find that the French have reported 36 cases of kidney malignancy, the English 30, the Americans 21, the Germans 14, the Russians 2, and Italians one. Careful analysis of these cases shows that malignancy is five times more common in males than in females; that the average duration of the calculi symptoms was nineteen years, and the particular symptoms of malignancy about five months. The average age at which the diagnosis was made was fifty years, the youngest being sixteen and the oldest seventy-seven.

The left side is more frequently affected than the right. The symptoms occur in the following order: blood, pain, tumor mass, and cachexia. Pain persisting after the removal of a stone from the kidney should arouse suspicion of a developing malignancy. The authors then review the methods of operating upon the kidney with reference to their development. In their opinion, if the malignancy is found to be outside of the capsule of the kidney, operative procedure is useless.

The ureter should be attacked first, isolated and amputated by the actual cautery. The blood-vessel should be ligated well back from the kidney pelvis. Aside from this, operation for removal of kidney on account of carcinoma presents no more complications or sequellæ than does the removal of the kidney for any other disease. The authors believe that every kidney harboring a stone should be regarded as potentially malignant and early operation be indicated as a preventive procedure. Blood in the urine is traceable to the kidney, with or without pain, and whenever the diagnosis cannot be made, an exploratory operation should be done, and if malignancy is found, the kidney should be removed. If the operation is deferred until a tumor is palpable, the chance of recovery is small.

Of 20 cases of malignancy reported by Rafin, 7 died due to the operation: 8 had recurrence varying from ten months to eleven years. Of 20 cases collected by Czerny, only 5 were alive after the first five years. Of Walker's 145 cases, only 4 were alive after three years and 3 after five years. Of 61 cases operated upon by Mayo, 7 died in the hospital, 17 remained alive more than one year, 12 after three years, 4 after five years, and 1 after eight years.

Of the 83 cases collected from the literature, the authors find 30 primary epithelial tumors, 35.1 per cent arising in the renal parenchyma associated with calculi.

Of 140 stone kidneys studied by Coryell, there were none associated with mesotheliomata or sarcomata; of 32 cases of mesotheliomatous tumors reported by Wilson, none were mentioned as containing stone. Nevertheless, there has been found a total of 84 tumors of the kidney associated with stone, in which conclusions as to the location of the calculi is possible. There were 10 or 12 per cent mesotheliomatous, 30 or 35 per cent epitheliomatous tumors of the parenchyma, and 22 or 26 per cent epitheliomatous tumors of the pelvis and ureter, and 22 or 26 per cent cystic. If these findings be reliable it will be noted that stone is frequently associated with epithelial growths. The next most frequent are the cystic tumors and last the mesotheliomata and sarcomata.

The authors further discuss the reports of cases by different writers and the location of tumors in the kidney. They note that in the study of all of their cases they find only three cases containing both stone and tumor, in which the stone was found in one kidney and the tumor in the other. After a study of the statements of various writers regarding the probability of the production of tumor in the kidney by stone, they conclude as follows:

1. Epithelial tumors of the kidney are most frequently associated with renal calculi. Of these, the relative proportion of association is greater in epithelial tumors of the kidney pelvis.

2. Cystic tumors associated with renal stone are next in frequency.

3. The coexistence of renal calculi and mesotheliomatous and sarcomatous tumors is rare.

4. There does exist a definite and constant relation between stone and epithelial tumors of the same kidney, the stone in the majority of cases, 56 per cent in epithelial tumors of the parenchyma and 63 per cent in epithelial tumors of the pelvis and ureter, being the primary lesions, "which because of its irritation, direct and consequent, is the principal etiologic factor in the production of the neoplasm."

5. In cystic tumors of the kidney, in true polycystic degeneration the calculus is invariably secondary, or but chance, while in a large single cyst it not infrequently is one of the etiologic factors.

6. In mesotheliomatous tumors the stone is always secondary, or of but rare occurrence, while of the sarcomatous neoplasms they have collected two cases with an uncertain relationship existing, while in the third case the stone was secondary.

7. The coexistence of stone and neoplasm in the kidney of a child must be extremely rare. In their searches they have found no such association. The reference made by Ping-Amettler is incomplete.

This article is a distinct contribution to the subject of stone in the kidney and its relation to cancerous growths of the same. It is well worth the study of any one interested in this subject.

A. C. STOKES.

Chiasserini, A.: Contribution to the Study of Large Serous Cysts of the Kidney (Contributo allo studio delle grandi cisti sierose del rene). *Clin. chir.*, Milan, 1916, xxiv, 964.

Serous cysts of the kidney are often found at autopsy. Their frequency increases with the age of the subject. Lubarsch in 500 kidneys of individuals above 50 years found that 79 per cent contained macroscopically visible cysts; Braunwarth indicates even a larger percentage. But the larger serous cysts are comparatively rare. Simon in 1906 collected 53 cases from the literature and in 1911 Brin, adding and subtracting from Simon's statistics, reported the same number of true large serous cysts of the kidney.

Chiasserini in a review of the literature since Brin's report up to date has found 15 additional cases. He reports a case in a man 70 years old. The cyst was about as large as a foetal head at term, and was found to be attached to the inferior pole of the left kidney. Chiasserini thinks that the cyst was congenital, due to embryonal malformation, this opinion being based on the fact that (1) there were no signs of any chronic inflammatory process observed in the kidney; (2) the peculiar histologic appearance of the cyst walls.

W. A. BRENNAN.

Crabtree, G., and Cabot, H.: Colon Bacillus Pyelonephritis; Its Nature and Possible Prevention. *J. Am. M. Ass.*, 1917, lxviii, 589.

The authors detail the results of their clinical and laboratory observations on the lesions produced and

etiologic factors concerned in the production of the colon type of renal infection.

The portal of entry of the bacillus into the blood stream is not always demonstrable; the recovery of the bacilli from the blood stream in such cases leads them seriously to doubt the occurrence of renal infection either by extension along the lumen of the ureter or by pure lymphatic extension, without the intervention of the blood stream.

The bacilli once reaching the tubules, pass to the pelvis and produce a pyelitis, multiplying both in the recesses of calyces and in the mucosa of the pelvis and ureter, damaging the convoluted tubules, although this damage is of short duration.

The chronic stage shows a thickened, lax, dilated pelvis lined with thickened mucosa, and infiltrated with lymphocytes and some pus-cells. In the tips of the papillæ there is scar tissue formation and lymphocyte infiltration with narrowing of the cortex. The ureter shows the same chronic changes and as a result of stasis the end stage is pyonephrosis.

The authors have studied the evidence of immunity production in colon bacillus pyelonephritis under three headings:

1. A result of accidental infection.

2. An artificial production in chronic cases with pyuria vaccination.

3. An artificial production of immunity in uninfected cases with a view of preventing infection as a complication to operation.

The authors have observed that the cases of so-called idiopathic colon pyelonephritis in which there could be demonstrated no abnormality of the kidney or the lower urinary tract occurred in patients whose normal resistance had been lowered from overwork, underfeeding, recent or chronic illness, recent pregnancy, or acute intestinal disturbances.

The authors claim that while the vaccine treatment for the artificial production of immunity proved beneficial to symptoms, it is as a rule not curative of the condition.

In the study of the uninfected cases, the authors state that the largest element of danger to the patient is renal infection, and to eliminate this danger, they administer the mixed colon vaccines during the periods of preliminary preparation; where possible it is begun a week before the patient is admitted to the hospital, and continued to the time of operation.

In conclusion, they claim that while the colon bacillus is not the only organism concerned in renal and bladder infections, it is the permanent infection, and if avoided the patient is usually able to resist the other bacteria; it is also their belief that the immunity conferred by the colon vaccine is of short duration, and advise that the administration of the vaccine in prostatics should be made to extend over the period of convalescence.

LOUIS GROSS.

Porter, M. F.: The Surgical Aspects of Kidney Disease. *Interstate M. J.*, 1917, xxiv, 195.

The importance of an operation upon the kidney itself or upon some other part of the urinary apparatus lies in the fact that reflex anuria is particularly prone to follow. Given a prospective surgical case in which impairment of kidney function is known to exist, the surgeon must determine (1) the degree of impairment and (2) the character of the impairment. Experience has demonstrated that quite marked impairment of the kidney function is not incompatible with a reasonable degree of safety in surgical procedures, the nature of the lesions being almost as important to the surgeon as its degree.

The disturbances of renal function may be divided into (1) those due to structural changes, (2) those due to inhibition, toxic or reflex, and (3) those due to a combination of these conditions. In the author's experience the most common causes of disturbances of renal function are: (1) obstructive lesions of the bladder (especially enlarged prostate) and urethra, and (2) obstruction of the bile-ducts.

Uræmia has been the most frequent cause of death after operation for obstruction of the bile passages, in the author's experience. An infection of one kidney not infrequently causes a diminution of function in its healthy mate, which diminution entirely disappears after nephrectomy or nephrotomy. Occasionally one finds both kidneys diseased structurally, and yet neither functionates so well as it would were it not for the toxic influence arising from its mate, as for instance, in double calculous pyelonephrosis. In such cases surgery may demand an operation upon one kidney, usually the poorest one, even though the function is much below the level of safety, in the hope that the relief from the toxic and reflex influence thus caused may bring the kidney function up to or above the safety level.

In the author's experience patients suffering from less acute infections will oftentimes die if the necessary operation is postponed until fair kidney function is obtained. He has successfully done thyroidectomy, gastro-enterostomy, and prostatectomy with a phenolsulphonephthalein output of 30 per cent or less in two hours in cases wherein a careful study led to the conclusion that the kidney function was being strongly inhibited by conditions that these surgical procedures would remove or ameliorate. On the other hand, there is a group of cases in which symmetrical permanent changes in the kidney have reduced the function to nearly zero, and in which all preliminary treatment proves futile. In this group of cases the slightest operation may prove fatal, even cystoscopy. The wise surgeon will, of course, not operate where these conditions exist.

Errors are unavoidable, but the error should be on the side of safety to the patient rather than on the side of safety to the operator. It goes without saying that operations on these patients in extreme cases will usually be palliative rather than curative, and that the operative burden laid upon them should

be the lightest possible. To this end local anesthesia must often supplant general anesthesia, or be used in connection with it with a view to reducing the amount of the general anesthesia to the minimum.

The author calls attention to two observations in connection with injuries to the kidneys: First, most cases of injury to the kidney in which the trauma is slight occur in children or in young adults. This suggests that there may exist in many of these cases congenital abnormalities of the urinary apparatus or abdominal viscera. Second, the experiments of Falcone, referred to by Bugbee in his recent paper "Traumatic Injuries of the Kidney and Ureter," seemed to show that crushing of one kidney causes permanent disfunction in its fellow. These experiments were made on dogs, and while, as Falcone says, a strict clinical application to man is not possible, yet these experiments seem to show that in a given case of laceration or crushing injury to one kidney, the demonstration of subnormal function in its fellow would be an argument in favor of the immediate removal of the injured one. The author quite agrees with Bugbee, who says that these observations are worthy of further study.

The conclusions are:

1. While kidney insufficiency should often bar surgical interference, especially in operations of expediency, on the other hand it may be an additional argument in favor of operative interference.

2. The final decision for or against operation should be based on the clinical judgment of the surgeon as applied to the case in hand.

3. In these bad risks the surgeon's aim should be relief rather than cure, and the operative burden put on the patient should be as light as possible.

THEO. DROZDOWITZ.

Kolischer, G.: Some Difficulties in Kidney Surgery and Their Solution. *Urol. & Cutan. Rev.*, 1917, xxi, 1.

The flexibility of the skin incision depends upon undermining each border of the cut. The incision should not be placed too close to the twelfth rib. Retractors should be used which make the wound as shallow as possible, and if one uses a blade that is longer than one's finger manipulations in the depth of the wound are extremely difficult. All vessels should be doubly ligated. Shrinkage of the ureter may furnish an obstacle to the delivery of the kidney; therefore the ureter should be severed first. Often it is necessary to clamp the kidney pedicle, remove the kidney, and later tie off the pedicle. Two clamps should be used, one placed above the other. In this way it is possible to ligate the vessels separately.

Heidenhain recommends progressive intracapsular ligation of the pedicle. When used the capsule is incised 1 cm. from the tip of the pedicle and this cuff is detached, digging toward the insertion of the blood-vessels. By twisting the whole kidney toward the inside, the upper pole forming the pivot,

the renal pelvis detaches itself from the tissue containing the blood-vessels and is not opened.

Transplantation of fat is done to avoid post-operative hæmorrhage.

B. S. BARRINGER.

Keyes, E. L., Jr.: The Advantage of Pyelotomy Drainage for Nephrotomy Wounds. *J. Urol.*, 1917, i, 91.

The author mentions the past and prevailing ideas relative to drainage of pyelotomy and nephrotomy wounds. He also reports in detail one of his recent cases to illustrate the advantage of pyelotomy drainage for nephrotomy wounds.

The old idea that incisions of the kidney pelvis heal badly has been abandoned since the advent of correct urologic diagnosis and the assurance after operation that no obstruction remains to the flow of the urine through the urinary tract.

The author has noted a number of slow-healing nephrotomy wounds in which there was no obstruction to the flow of urine in the urinary tract. These, in his experience, are usually relieved by passing an ureteral catheter or by allowing a catheter to remain in the ureter for some time. The author has not seen any slow-healing pyelotomy wounds.

A detailed report follows of a case in which there was no right kidney and anuria was present in the left side. Nephrotomy was done on the left kidney. Urine spurted from the pelvis under tension and no obstruction was found in the ureter. Urine continued to drain through the incision so that the patient was re-operated upon. An obstruction was found at the ureteropelvic juncture, probably the result of recent infection secondary to infection of the bladder and ureter. The stricture was divided and urine passed in the usual manner for some time but later stopped again for a few days, after which a small stone passed.

The conclusions are as follows:

1. Congenital absence or total atrophy of right kidney and consequently hypertrophied left kidney.
2. Anuria probably due to ureteral kink from mobility of a large left kidney.
3. The stricture found at second operation was the result of (a) trauma of first operation (nephrotomy), secondary to (b) streptococcal infection.
4. The stone was not present at the time of operation. It probably resulted from infection.
5. It is probable that the slow healing of nephrotomy wounds in some instances is due to blocking of the upper ureter by pus and blood that accumulates in the kidney pelvis.

The author has since drained the renal parenchyma wound through the pelvis in three instances with prompt healing.

GILBERT J. THOMAS.

Oliva, L. A.: Pyelotomy or Nephrectomy (Pielotomia o nefrotomia)? *Gazz. d. osp. e d. clin.*, Milano, 1916, xxxvii, 1444.

The author reports a case of right kidney ptosis and intermittent calculous hydronephrosis. After

pyelotomy, extraction of a voluminous calculus, and nephropexy there was immediate and permanent recovery.

Oliva thinks that in non-infected or weakly infected renal calculus with the kidney easily exteriorized and when the calculus is easily enucleated, pyelotomy followed by lithotomy is to be preferred. In cases that are certainly infected whether the kidney is prolapsed or not and whatever may be the number and volume of the calculi nephrolithotomy should be done.

In non-infectious or weakly infected calculus, but when the kidney can be exteriorized only with great difficulty, no matter how many or what may be the volume, etc., of the calculi, pyelotomy would rarely be successful and nephrolithotomy should be the operation of choice. W. A. BRENNAN.

Pilcher, P. M.: The Technique of Nephrectomy for Renal Tuberculosis and Other Infections of the Kidney. *Miss. Valley M. J.*, 1917, xxiv, 54.

The author believes that poor results following nephrectomy for tuberculosis are due in many cases to faulty technique, leading to the development later of tuberculosis of the wound. Attention to three particular points is necessary in order to avoid later infection:

1. Adhesions of the kidney to surrounding tissues. In entering the fatty capsule, if adhesions are encountered between it and the cortex, they should not be stripped off at this point owing to the danger of opening a tubercular abscess. Such adhesions should be tied and cut with especial care. He has found it an advantage to attack the upper pole first.
2. Ligation of the vessels. The upper pole having been freed it is usually possible to expose the vessels by blunt dissection and ligate them before attacking the ureter. The vessels being divided, the kidney should be allowed to hang from the lower end of the wound and the wound cavity closed off.
3. Division of the ureter. Ten to fifteen drops of 95 per cent phenol is injected into the upper ureter with a hypodermic syringe, after which the ureter is clamped and cut and the stump cauterized, the stump of the ureter being secured to the lower angle of the wound by sutures. HORACE BINNEY.

Misuraca, F.: Lesions Caused by Suturing the Renal Parenchyma; Experimental Research (Lesions déterminées par les points de suture dans le parenchyme rénal; recherches expérimentales). *J. d'uro.*, 1914, vi, 615.

The author has made a number of experiments on dogs to determine some of the problems which arise from sutures which involve either the perirenal fat tissue or the fibrous capsule and to determine whether it is dangerous to pass sutures through the renal parenchyma. Many methods have been devised and many experimental investigations reported since Hahn in 1881 first practiced kidney fixation; but even so there are many points still in doubt. The author passes in review the various findings by preceding investigators.

In his own experiments Misuraca never observed abundant and persistent hæmaturia, fistulæ, or urinary infiltration, calculus formation, or cystic dilatation of the uriniferous canaliculi, nor other complications. The alterations observed in the kidney itself, which are almost inappreciable macroscopically, fall into two categories. The first are permanent and are found about the suture points in the parenchyma and consist in necrosis and consecutive inflammatory reaction. This causes a gradual disappearance of specific glandular elements and their replacement by scar tissue. Secondly, there is a limited sclerotic zone seen which follows the path of the thread. In all the renal parenchyma involved by the restricting thread there are circulatory disturbances (interstitial or even intracanalicular hæmorrhage), stasis and dilatation of the glomerules and reactionary alterations of the parenchyma. The latter are evidenced by tumefaction of the cortical epithelium and later by its degeneration. There is shortly in all this zone a state of parenchymatous nephritis, which attains its maximum in about twenty to twenty-five days. Such disturbances are not permanent. They gradually disappear leaving only slight traces.

Thus from the limitation of the alterations in the first group and the instability of those in the second, it can be inferred that suturing through the renal parenchyma, far from causing the grave alterations described by certain observers, are generally exempt from important complications and do not compromise the general functioning of the organ.

W. A. BRENNAN.

Burns, J. E.: Further Observations on the Use of Thorium in Pyelography. *J. Am. M. Ass.*, 1917, lxviii, 533.

The solution (unchanged from original report) containing double citrate of thorium with an excess of sodium citrate and some sodium nitrate, is by far the best. Two solutions are used, 10 per cent for cystograms and 15 per cent for pyelograms. The 15 per cent solution contains approximately 15 per cent of thorium nitrate, about 9 per cent of sodium nitrate, and 21 per cent of sodium citrate, the thorium being probably in the form of a double citrate of thorium and sodium, and not occurring as the nitrate.

In 185 cases, occurring in over one year, no untoward effects have been observed, other than would occur in that number of catheterizations without injection. That the solution is non-irritating is shown by the absence of any urinary symptoms after its use and the absolute lack of any such evidence cystoscopically, and at operation.

Too much emphasis cannot be laid upon the desirability of the gravity method with the elevation slightly higher than the patient, the solution being allowed to flow in until the patient complains of a sensation of fullness in either kidney region. The exposure to the roentgen ray is then made, the solution being allowed to flow into the renal pelvis during the exposure.

The pyelograms and cystograms made with this solution show a splendid shadow which possesses an unusual clearness of delineation. The accentuation of the shadows of calculi by this solution, when they are not seen in the plain roentgenogram, is brought about either by the adhesive properties of the solution, by its capability of being absorbed, or by means of its comparative density.

The solution being clear and watery possesses a great degree of fluidity, permitting its ready elimination from the urinary tract. It is perfectly clean and does not stain the linen. In this particular it possesses another marked advantage over other solutions, particularly those of the silver salts.

DAVID R. BOWEN.

Macht, D. I.: A Contribution to the Physiology of the Ureter and the Vas Deferens. *J. Urol.*, 1917, i, 97.

The author's researches have been primarily of a pharmacological character, but during the process of the work many physiological facts of interest in regard to the ureter and vas deferens have been brought to light and the paper presented is a summary of the data thus obtained.

The movements and behavior of the ureter were studied in three ways: (1) Experiments were made with segments and rings of excised ureter. Longitudinal sections of the ureter were not as suitable as rings and the most convenient preparation was from the pig ureter. (2) The behavior of the ureter was studied by direct inspection of the ureter *in situ* in living animals. For this purpose a rabbit was found to be the most convenient animal as the ureter is very large and not concealed by an excessive amount of fat. (3) Whenever practicable, observations were made *in vitro* on rings of human ureter obtained from cases of nephrectomy. It was found that the results obtained by all the methods employed agreed with each other.

The behavior of the vas deferens was studied in the same way: (1) on excised vasa of dogs, cats, rabbits, rats; (2) by observation *in situ* in rabbits and guinea pigs under anaesthesia; and (3) on segments of human vas obtained from the operating room. Unlike the ureter, in which ring preparations were found to be much better at that date for the study of ureteral contraction and longitudinal strips, in the case of the vas ring preparations were found to be unsuitable, and all the observations were made on longitudinal segments. Here, however, as in the case of the ureter, the results obtained by the different methods all agreed with each other.

When an excised ureter is suspended in a suitable oxygenated medium, at a proper temperature, it will begin after a period of from thirty minutes to one hour to exhibit spontaneous rhythmic contractions. Such a ureteral ring will beat for hours with surprising regularity at the rate of from five to seven times per minute and will inscribe a curve on the kymograph not unlike that made by a beating frog's heart.

It is interesting to note the remarkable vitality of the excised ureter. Just as the author found that he could preserve alone the pulmonary and other arteries for a long time after excision, so also in the case of the ureter it was possible to revive the contractions of that organ as late as forty-eight hours after excision, provided the tissue was preserved in a suitable solution and kept in a refrigerator.

In the case of the vas deferens, suspension preparations also exhibited mixed contractions, but these movements are not so constantly nor so easily obtained as in the case of the ureter.

As to the most suitable media, spontaneous contraction of the isolated ureter was best secured in dissections of Locke's solution, which is a modified Ringer's solution, plus dextrose. In ordinary Ringer's solution the contractions are not as active, while in normal sodium chloride solution the tissue quickly dies and the contractions cease. A still better medium is obtained by the addition of small quantities of urea about 0.2 of 1 per cent to the Locke's solution. The optimum medium for the study of the isolated ureter, however, is a mixture of Locke's solution with fresh acid urine in proportion of about 10 to 1. It appears then that a slightly acid medium is necessary for the maintenance of normal ureteral contraction. A drop of alkali will stop the contractions altogether, but exactly the reverse holds true for the vas deferens. Here it was found that the vas exhibits its movements better in Tyrode's solution than in Ringer's or Locke's, Tyrode's having a lesser hydrogen ion concentration than Locke's solution, and that the addition of a little sodium bicarbonate improves the contraction still more. Thus it is seen that for the contraction of the ureter a slightly acid medium is the optimum, while on the contrary for the movements of the vas deferens a slightly alkaline solution is most suitable. If we bear in mind that in most higher animals the urine is acid, while the spermatic fluid is alkaline, we cannot fail to note the striking agreement of the movements *in vitro* just studied with the condition prevailing in exactly the same way. The author here notes that the studies of Langley and Elliott exhibit epinephrin as the principal drug used in attacking all true sympathetic or dorsal-lumbar autonomic nerve-endings—whether pressor or depressor, accelerator or inhibitor, constrictor or dilator, wherever they may be, and stimulating them just as an electric current would do. The response of the ureter and vas deferens to epinephrin is therefore proof positive of their innervation by the true sympathetic. This is further corroborated by their behavior toward ergotoxin.

As to the action of ergotoxin, this important constituent of ergot is also a sympathetic-mimetic drug affecting the true sympathetic. Its physiological effects are: (1) a stimulant on muscular organs; (2) a specific paralysis of the motor elements in the structures associated with sympathetic innervation, which adrenalin stimulates.

As a result of this peculiar selective action, the

effect of epinephrin on those organs which are supplied with both motor and inhibitor sympathetic terminals, is reversed by ergotoxin. Thus an animal which is first injected with ergotoxin, will respond to a subsequent injection of epinephrin with a fall instead of the ordinary rise in blood-pressure, because the motor terminals having been paralyzed by the ergotoxin, the suprarenal principle can act only on the inhibitor terminals which are still intact. This takes place when ergotoxin is used before epinephrin in the living body.

Lack of oxygen was found to diminish contraction, both in strength and frequency, in the ureter and vas. This was improved by restoring the oxygen supply.

The optimum temperature was found to be about 37°C. Gradually raising the temperature above 38° at first stimulates the contraction, but further increase in temperature paralyzes movements, 41°C. being the upper limit. Higher temperatures will kill the protoplasm. On gradually lowering the temperature the movements are slowly inhibited and at 30°C. they are paralyzed entirely. Restoring the temperature to normal, however, tended to revive the contractions.

Pharmacological data on the innervation of the ureter and vas deferens is given as follows:

1. General. The innervation of the ureters may just as well be studied by the effect of various chemicals on the nerve-end plates as by actual dissection.

2. Action of epinephrin. When one drop of a 1:10,000 solution of epinephrin is introduced into a chamber filled with 50 ccm. of Locke's solution and containing a ureteral ring preparation, the ureter begins to contract more frequently and more vigorously and its tonus is distinctly increased. This takes place even in an otherwise quiescent ureter. If larger doses are used the contraction becomes very rapid and at the same time short, owing to the greatly increased tonicity, until the ureter finally passes into a condition of tonic contracture or tetanus, lasting for an hour or more and then gradually wearing off. The vas deferens and seminal vesicles are stimulated by epinephrin on the ureter and vas, furnishing an additional proof of the true sympathetic innervation of these organs.

3. Action of nicotine. The action of nicotine on the ureter is exactly the same as on other organs, as for example the heart. Small doses stimulate the contractions and large doses paralyze it. This response to nicotine points to the existence of ganglionic structures in that organ.

4. Action of atropine. Atropine when given in sufficiently large quantities antagonizes the action of all the other drugs and inhibits contraction.

The author's conclusions are: (1) The isolated ureter contracts best in a slightly acid medium. (2) The isolated vas contracts best in a slightly alkaline medium. (3) Rise in temperature first stimulates and subsequently paralyzes the contractions of ureter and vas. (4) A falling temperature inhibits the contractions. (5) The re-

sponse to drugs shows that the ureter and vas are innervated by the dorsal lumbar or true sympathetic nervous system, also by the sacral autonomic or parasympathetic nervous system. The response to nicotine points to the presence of ganglion cells in the walls of these organs.

H. W. PLAGGEMEYER.

Caulk, J. R.: Ureter Catheter Drainage in the Treatment of Renal Infections, with Special Reference to the Infected Hydronephrosis Complicating Pregnancy. *J. Am. M. Ass.*, 1917, lxviii, 675.

The author discusses the pathology of renal retention and infection due to obscure causes such as aberrant blood-vessels and that due to pregnant uterus, and the use of the ureteral catheter in relieving these conditions. The extent of pathological change is of the greatest importance from the point of view of cure. Following Perineau, he believes that the condition can be divided into three stages as follows:

1. In the first stage the pelvis has been but little dilated, the muscle-fibers in its walls are under considerable tension but have not lost their tone. The contained urine is under pressure and a catheter inserted into the pelvis is followed by an issue of urine in a jet. Renal function may still be normal.

2. In the second type dilatation has begun, the muscle-fibers are weakened and somewhat stretched but if the intrapelvic pressure is relieved they may return to a normal condition. As the urine is not under great pressure it issues from the catheter in drops, more rapidly if pressure is made on the kidney. Renal function is impaired.

3. In the third stage the pelvis has become over-stretched, the muscle has permanently lost its tone and is incapable of returning to normal. Renal function is greatly impaired or destroyed.

The use of the ureteral catheter in the first stage may give relief after one or two catheterizations only. In the second stage its use must be more prolonged or repeated oftener. The author points out that in this stage cystoscopy may be deceptive. The observer may see a plug of pus oozing from the ureteral orifice. The passage of a catheter, however, may clear away the plug and reveal that pale, milky urine is being secreted by the kidney and not pure pus as the cystoscopic picture suggests. Such a kidney is capable of great improvement by catheter drainage.

In the third stage where function is destroyed no permanent benefit can be obtained by catheterization but the patient can be relieved of sepsis, uræmia, etc., and a much better pre-operative condition be obtained.

The mechanism and pathology of pyelitis occurring in pregnancy is fully described and cases cited in which relief has been obtained by the ureteral catheter. Since the condition arises most commonly in the fifth or sixth month of pregnancy when the largest diameter of the uterus is at the pelvic

brim, it seems evident that the condition is due to pressure upon the ureter at that point, renal retention and infection following. Colon bacillus infection is the rule.

As a considerable proportion of these cases would otherwise abort, pregnancy may thus be brought to full term and the child's life saved. In cases which do not respond to catheter drainage the kidney has probably reached the third stage of retention and destruction, requiring subsequent nephrectomy.

HORACE BINNEY.

Geisinger, J. F.: Reduplication of the Ureter. *Ann. Surg.*, Phila., 1917, lxxv, 355.

Geisinger reviews the embryologic basis of anomalies of supernumerary ureters, particularly that type which presents a bladder orifice at one end and an independent pelvis at the other.

Four cases are reported, in three of which diagnosis was confirmed by ureteropyelography. In one case double ureters were found on the right side; in one case double ureters were found on the left side; in one case double ureters were found on the right side; and in one case there were double ureters on the right side. Attention is called to the importance of a careful cystoscopic review of all renal conditions. The author believes that these anomalies are not so rare as they are generally believed to be, and the reason why more are not found is because cystoscopists do not look for them. Frequently, after having found and catheterized the ureters the inspection halts, the possibility of a third ureter not being thought of.

The failure to find a supernumerary ureter in diseased kidneys should be obvious. If the third ureter is not eventually discovered, primary catheterization of the other two may lead to exclusion of the urinary tract from further consideration, while the patient is hopelessly treated in some other direction.

H. W. E. WALTHER.

Young, H. H., and Davis, E. G.: Double Ureter and Kidney, with Calculous Pyonephrosis of One Half; Cure by Resection; the Embryology and Surgery of Double Ureter and Kidney. *J. Urol.*, 1917, i, 17.

The authors report the case of a man of 57, who complained of a pain in the left flank and frequency of urination, every two hours by day and night. Neither kidney could be felt nor was there any tenderness in the kidney region; the urine showed a trace of albumin, much pus, and numerous bacilli. A radiograph showed a large, irregular, branching calculus in the upper pole of the left kidney. Catheterized urine showed pus, diminished phenolsulphonephthalein from the left kidney, and normal urine and normal phenolsulphonephthalein from the right. A thorium pyelogram showed on the left side a double renal pelvis with bifurcation of the ureter at the level of the third lumbar vertebrae, and about 9 cm. below the lower pelvis. The upper pel-

vis was filled with the calculus. At operation the lower portion of the left kidney was seen to be normal in appearance, a little larger than half of the normal kidney and only slightly adherent to the fatty capsule. The ureter going from the lower segment was found to be slightly dilated. The upper segment surrounded by dense adhesions was much larger than the lower and the calculus could be plainly felt. Without disturbing the blood supply of the lower segment, the upper part was removed and the wound sutured. When the patient returned to the hospital four months after operation he had uninfected urine from either kidney. His general condition was excellent.

Botez, basing his calculation upon 51,504 autopsies, found horseshoe kidney occurred once in 715 cases, while in a series of 1,000 kidney operations the proportion was 1 in 143. From this he concluded that a horseshoe kidney is more apt to become diseased than a normal kidney. Robinson in 50 specimens of duplicate ureter found that hydro-ureter occurred in 24 per cent. In 24 cases of explored double kidney and ureter the pathological process was located in the upper kidney segment in 19 instances.

It is fair to assume that the obstruction of the superior ureter, due to its position with respect to the lower kidney segment and to the kidney pedicle, is an important factor in producing disease. Ureteral duplication with double pelvis and kidney is surprisingly common. It occurs more frequently than all other forms of gross renal anomaly taken together. According to various statistics, from 3 to 6 per cent of all individuals have double or bifid ureters.

In considering the embryological development the authors agree that the formation of incomplete double ureter may be accounted for by a premature or exaggerated bifurcation of the tip of the ureteral bud, the split extending varying distances joins the ureteral stalk instead of being confined to the bulbous tip or primitive pelvis. The authors have seen no case of partial ureteral duplication in which the portion of the ureter nearest the kidney was single and that nearest the bladder double. In case of complete double ureter the ureter which has its orifice lowest in the bladder drains the higher renal pelvis.

In literature are found 26 instances in which double ureter and kidney have been operated upon. All but two were operated upon because of a pathological process located in the anomalous kidney. In these two the operation was done because of incontinence produced by the supernumerary ureter opening externally. In all the remaining 24 the operation was undertaken because of a pathological condition of one segment of a double kidney, and in all but three cases, the remaining segment was normal at the time of operation. There were 16 cases of pyonephrosis (4 complicated by stone), 4 of tuberculous, 3 of hydronephrosis, and 1 of "acute surgical kidney."

B. S. BARRINGER.

BLADDER, URETHRA, AND PENIS

Shropshire, C. W., and Watterston, C.: *The Value of the Cystoscope in the Differential Diagnosis of Abdominal Lesions.* *Miss. Valley M. J.*, 1917, xxiv, 66.

Since diagnosis is the basis of all scientific medicine it should be as exact as possible. Every means at our command should be used in arriving at a correct understanding of the pathological condition which causes the signs and symptoms existing in each individual patient.

If the modern methods of diagnosis are employed it will seldom be found necessary to open the abdominal cavity or to do an exploratory operation on the kidney or genito-urinary tract.

Pain, the most predominant and misleading symptom, exists in every case. The very best results in the differential diagnosis of abdominal lesions are obtained by the combined efforts of the surgeon, cystoscopist, roentgenologist, and laboratory technician. The authors believe that a cystoscopic and radiographic examination should be made in every case which borders on uncertainty. The authors quote Chute of Boston, who reported a case of renal calculus causing marked intestinal symptoms, referable to the splenic flexure of the colon. In this case the cystoscopic and roentgenographic examinations cleared up the diagnosis. Following an operation for the removal of a large calculus relief was immediate and the patient had no further symptoms.

The authors report a case somewhat similar to the above. There was intense abdominal pain, which was general, accompanied by marked tenderness to pressure along the lower border of the ribs on the left side, intermittent vomiting, a distended abdomen and a temperature of 102°.

Cystoscopic examination showed the following results: bladder negative, right ureteral opening negative, left ureteral opening very much congested. The catheter was passed to the right pelvis without difficulty; on the left the catheter met with some resistance about five centimeters above the ureteral opening. Functional test with phthalein was as follows: Right—thirty minutes, forty-eight per cent; left—thirty minutes, ten per cent.

Thorium was injected into the left pelvis and the radiographic examination showed a large irregular shadow extending from the kidney region downward to the brim of the pelvis. The diagnosis was hydronephrosis on the left side.

This case is very similar to the one reported by Chute, and had the surgeon based his diagnosis on the patient's symptoms, which were manifestly intestinal, a pre-operative diagnosis would not have been made.

Another illustration of the value of the cystoscope in the differential diagnosis of lesions, apparently in the abdominal cavity, would be the following case in which the symptoms were those of gall-stones.

A man of thirty-six had severe pain in the right upper quadrant, tenderness at the lower costal margin, constipation, tympanites and vomiting. His pain was paroxysmal, and it was necessary to administer morphine on quite a number of occasions. These attacks had been common during the last two years. A diagnosis of gall-stones was made and the patient was prepared for operation on the following day. An examination of the urine just before operation revealed the presence of pus and blood.

The abdominal operation was deferred and cystoscopic examination ordered.

The bladder and left ureteral opening were normal; the right ureter was slightly congested and exuded pus; urine from the left ureter was negative; urine from the right ureter contained a large amount of pus. Functional test, using phthalein intravenously: right—thirty minutes, fifty-two per cent; left—thirty minutes, trace. The diagnosis was abscess of the right kidney, probably due to renal calculus.

Abdominal section showed the gall-bladder and ducts to be normal; the right kidney was enlarged and adherent to the surrounding structures. The kidney was removed and on section it was found to contain numerous abscess cavities filled with pus; no stone was found. The patient made an uneventful recovery.

The conclusions are:

1. Too much reliance should not be placed upon pain or even tenderness to pressure in vague abdominal lesions.

2. Lesions of the left kidney often produce symptoms referable to the intestinal tract.

3. Renal colic is caused only by overdistention of the renal pelvis; an obstruction in the lower third will often cause symptoms referable to the kidney region.

4. Cystoscopic and radiographic examinations are absolutely necessary in the differential diagnosis of abdominal lesions.

THEO. DROZDOWITZ.

Lowsley, O. S.: Observations on Certain Obstructions at the Vesical Orifice. *J. Am. M. Ass.*, 1917, lxviii, 444.

The author discusses vesical orifice obstructions other than those caused by enlargement of the prostate proper, and cites various pathological conditions that produce this type of obstruction.

In a careful study of 350 prostates collected at autopsy, the author finds enlargements of the subcervical group of tubules in 25 per cent of patients over 30 years of age. He found, further, that in practically all cases of adenomatous hypertrophy of the prostate, there was an accompanying enlargement of the subcervical group of considerable degree. Therefore, it is assumed that the same factor which causes an adenomatous hypertrophy of the prostate also stimulates an overgrowth of the subcervical group of tubules; and, furthermore, it is believed that the latter structure responds to this stimulating influence before the prostate itself does. The enlargement of the subcervical group of tubules

occurs in several forms, the most frequent being the small single tumor, which occurs in a midline at the vesical orifice and usually projects through the internal meatus into the bladder. Next in frequency of occurrence are the medium-sized single tumors. In addition to the single tumors of various sizes, there are a number of enlargements of this group which are partially divided. This division seems to be caused by a rather strong development of the bundles of muscle and connective tissue which extend from each ureter to the musculature of the posterior urethra. This group may be divided into several, usually three parts. The other type of subcervical tumor, is the so-called "horseshoe" tumor. This type is generally fairly large and usually encompasses the lower half of the circumference of the internal meatus.

Hypertrophic changes in the trigonal musculature come next in frequency as a cause of obstruction at the vesical orifice to urinary outflow. This condition was found in 7.6 per cent of the author's cases, and he states that it practically never occurs before 40 years of age.

The subtrigonal group of tubules which is found in all specimens between the middle of the trigonum and the vesical orifice is frequently the seat of pathological change. The most frequent lesion is ulceration. Sometimes tumors are found which are a source of obstruction. These tumors the author describes as (1) a low mound-shaped mass, (2) a pedunculated mass, and (3) a villous papillomata.

Fibrous stricture of the vesical orifice is not an infrequent source of obstruction to the urinary outflow, and is usually the result of chronic inflammatory processes; but it may also follow operative procedure in this region.

Cysts at the vesical orifice are occasionally met with, and in some instances are the cause of grave obstruction.

The diagnosis of the above conditions is based upon the pain, inability to completely empty the bladder, the passage of bougies and sounds which give a sense of riding over the obstructive mass at the vesical orifice. Rectal examination of the prostate will usually disclose evidence of chronic irritation. The cystoscopic examination is the most important part of the examination to be made in arriving at a diagnosis.

In the early cases the author advises the internal use of urotropine, with acid phosphate of sodium or sodium benzoate. For the burning and referred pains, instillations of argyrol or a weak solution of silver nitrate are used. The passing of sounds with occasional massage may sometimes give relief. These measures, however, are only palliative and will give only temporary relief. In the surgical management of these cases the author gives preference to the use of Young's punch, and he believes that it is decidedly the best method that can be employed in removing these intrasphincteric masses.

These tumors have also been treated by Stevens

and others, with the high-frequency current, with splendid results in some instances. Chetwood's operation is preferred by some operators.

The author believes that if it were not for the fact that an anæsthetic is required for carrying out Chetwood's operation, it would be decidedly the operation of choice. Cysts at the vesical orifice are best treated by the high-frequency current.

H. L. KRETSCHMER.

Burrows, M. T., Burns, J. E., and Suzuki, Y.: The Cultivation of Bladder and Prostatic Tumors Outside the Body. *J. Urol.*, 1917, 1, 3.

The authors report the result of the first attempt in the cultivation of bladder and prostatic tumors outside the body. The technique consisted in placing small fragments of the tumor tissue, 1 mm. in diameter, in a layer of medium, 0.5 mm. in thickness, on the surface of a cover glass, inverting over this a hollow ground slide, and sealing it in place with vaseline and paraffin. The cultures thus prepared were incubated at 37°C. Various kinds of media were used including plasma prepared from the blood of the patient from whom the tumor was removed, plasma from the blood of normal individuals, and a medium consisting of agar, 0.25 per cent, dissolved in isotonic sodium chloride, or isotonic sodium chloride and ascitic fluid.

Of the 12 tumors used, 7 were clinically malignant bladder papillomata; 1 a benign bladder tumor; 2 benign hypertrophies of the prostate; and 2 prostatic tumors, each of which showed one portion of typically benign hypertrophy, the other part having undergone a carcinomatous change. In the malignant tumors, cellular activity was noticed in all but two. One of these was a bladder tumor, in the removal of which a strong solution of cocaine had been used. The other was a malignant prostatic growth which had been exposed to radium for four months previous to its removal.

The authors believe that the energy-producing substances for the growth of cells in the culture do not come from the media, but are probably derived from the tissue fragments, and from the breaking down of cells contained within it. They believe that the growth may be defined as a simple transfer of material from the cells within the fragment to those on the periphery. In none of the cultures of the benign tumors was any cellular activity noted. Activity in the malignant tumors occurred in some as early as five hours and in all within twenty hours after preparation. These facts indicate that this method may be important in determining the malignancy, following the course of treatment, and studying the biological properties of these tumors.

H. L. SANFORD.

Randall, A.: Median Bars as Found at Autopsy. *Tr. Am. Urol. Ass.*, Chicago, 1917, April.

Randall presents a study of 300 autopsies on the adult male with ages ranging from 18 to 83 years, in an effort to demonstrate the gross pathologic charac-

teristics of median bar formation, as this side of the question of such obstructive growths at the vesical orifice had not been approached before.

In the 300 autopsies there were found 54 cases of median bar formation, or 18 per cent. Of these 54 cases 18 were classified as large bars, by which was meant that there was no doubt that the condition as found must have caused urinary obstruction and retention during life, and that the size of the bar and the damage to the urinary tract above it, stood out as a marked abnormality on examination of the specimen. These cases represent 6 per cent of the total series. In the remaining 36 cases, 12 per cent, the bar formation was recorded as small, signifying that though the abnormality was unmistakable on examination, the condition was not of so pronounced a degree, nor was it associated with other changes that would indicate positively that urinary obstruction of importance had yet occurred. These were simply the early cases, which had not developed to such a degree as those in the previous group.

To determine that bladder obstruction had existed during life, the author used the history as revealed by the autopsy findings in preference to the clinical histories, as the latter were frequently very incomplete (often so because of the type of patient dying in the wards of the large municipal hospital), though in each case that was classified as a large bar the clinical history was consulted and where of value or interest was detailed. The pathologic data, such as marked trabeculation of the bladder wall, diverticula formation, *bas-fond* formation, dilatation of the ureters, hydronephrosis, varying grades of chronic interstitial nephritis, and chronic infection along the urinary tract, were the criterions used to classify these cases as having been obstructive during life when occurring in conjunction with bar formation at the vesical neck. The author says, "Frequently in the absence of gross prostatic enlargement or the presence of urethral stricture, the marked damage to the urinary tract above the vesical orifice called for explanation rather than inquiry."

Randall divided the bars into two primary groups, fibrous and glandular. The fibrous bars were found to be due to a connective tissue fibrosis which formed a firm, dense, sclerotic bar or dam across the posterior vesical orifice whose free edge was thin and sharp. On microscopic examination they proved to be inflammatory in character and associated with an underlying chronic prostatitis, with marked connective-tissue formation. This type of bar he subdivided into two varieties according to whether the sclerosis caused shortening of the urethral or the trigonal surface. In the former (Type 1) there was found an approximation of the verumontanum to the vesical lip, often with the veru lying directly under the abrupt rise of the bar formation. In the second variety (Type 2) the trigonal surface seemed to be the one that suffered from the sclerotic process, causing it to be foreshortened and creased transversely, with an approximation of the ureteral

orifices to the vesical outlet. Four specimens of the first type were found in the 18 cases classified as large bars: they occurred at the ages of 58, 60, 65, and 67 years. Three cases of the second type were found in men, 59, 65, and 79 years of age, respectively.

The glandular group of bars was found to be due to a glandular hypertrophy originating in either of two localities and depending upon which was enlarged giving a third and a fourth group of obstructive growths. These hypertrophies were practically always unassociated with any gross hypertrophic changes in the lateral lobes of the prostate. In the first variety (Type 3) belong those where the hypertrophic process is limited to the posterior prostatic commissure, under the sphincter muscle and within the prostatic capsule; it causes a broad, thick, round edged bar of entirely different appearance from the fibrous variety, and which was proven on microscopic study to be due to glandular hypertrophy in the above mentioned tissue. The last variety (Type 4) comprises those cases where the hypertrophic process is limited to the subcervical glands of Albarran, just under the mucous membrane at the vesical lip and within the grasp of the sphincter muscle. They rarely cause a definite bar but rapidly assume the form of a rounded nodule with deep lateral cleftings. In the third type of bar there were four cases classified as large, occurring at the ages of 46, 50, 50, and 56 years. While in the fourth type there were seven recorded as large at the ages of 36, 48, 49, 56, 67, 71, and 73 years.

From this study the author concludes: (1) Age is in no wise a determining factor as to the type of bladder obstruction. (2) The fibrous types of median bars are due to chronic inflammatory reaction, and are but part of an underlying chronic prostatitis. (3) A glandular type occurs entirely apart from generalized prostatic hypertrophy. The paper was illustrated by numerous lantern slides of the various specimens encountered illustrating the types of vesical neck obstruction found in this series of three hundred autopsies.

Goldberg: Bladder Injuries. *Muenchen. med. Wchnschr.*, 1916, lxi, August 29.

The author reports two cases of complicated bullet injuries of the bladder during the war. A study of these and a perusal of the literature gives rise to these deductions:

According to Bartel, 1873, injuries of the bladder are always fatal if accompanied by peritoneal lesions. In the present war many such cases have recovered, owing principally to opportune surgical intervention.

In extraperitoneal bladder injuries, expectant treatment should be the general rule, careful consideration being given to an outlet for pus and urine by means of permanent catheters, and drainage of the projectile tract. Projectiles and bone fragments, easily extractable, should be removed.

Secondary complications, fistulæ (either due to

the projectile, to the operative wounds, or to urinary infiltration), calculi, and suppurative processes, may result years after receiving the original injury.

Care must be observed in effecting antisepsis of the wound and of the bladder by silver nitrate, collargol, urotropine, etc., peritonitis or urosepsis consecutive to urinary infiltration being a frequent cause of death.

W. A. BRENNAN.

Walker, J. W. T.: Bladder in Gunshot and Other Injuries of the Spinal Cord. *Lancet*, Lond., 1917, cxlii, 173.

The author reviews the anatomy and physiology of micturition, and the variations in micturition caused by disease or injury of the spinal cord. The author then gives a consideration of the cases observed and a discussion of treatment.

The bladder states in spinal cord injury and disease are: retention of urine, retention with overflow (passive incontinence), periodic reflex micturition (active incontinence), and paralytic incontinence.

The condition of the urinary tract is the most important clinical factor in cases of spinal cord injury. Urinary infection may be a contra-indication to operation on the spine or it may cause death soon after an operation. It may be fatal where operation has already given promising results, or where without operation the case is showing signs of improvement in the nerve-lesion. The two points of interest and importance emphasized are the variations in the function of micturition and infection of the urinary tract, following spinal cord injury. Two distinct stages of variation of micturition were observed, a stage of retention and a stage of periodic reflex micturition. The first stage commences with the injury and in 12 to 24 hours considerable distention of the bladder occurs, often without pain. After a time the urine dribbles away, the bladder remaining distended and the overflow escaping. The duration of this period varied from 24 hours to 18 months. The average duration in 30 cases was 55 days. In all but one of 70 cases this stage of retention was or had been present. This one had periodic reflex micturition from the time of injury.

The second stage comes on in days, weeks, or months and is, unless improvement of the spinal cord lesion takes place, the permanent state of the bladder. This transition from retention with overflow to periodic reflex micturition is not of sudden occurrence but gradual, at first the bladder contractions expelling a small amount of urine, gradually increasing until residual urine is small or absent.

Of the two varieties of sensation connected with normal micturition, the sensation of fullness and urethral sensation felt in the prostatic urethra, the latter is more completely abolished in these cases of paraplegia; the feeling of tension being preserved to a degree in a fair number of cases.

Bladder disturbance varied as to the level of the spinal lesion. In the cervical and dorsal regions, in a few cases, voluntary micturition was present if

the injury were slight, but in all the others in these regions there was complete retention if recent, and periodic reflex micturition when the injury was more remote. Of injuries involving the upper lumbar spine (seat of the micturition center) three cases with involvement of the eleventh and twelfth dorsal and first lumbar, one case of the first lumbar, and one case of the second lumbar, were observed. In two of these with partial lesion of the cord one had voluntary micturition, and one periodic reflex micturition. In three cases with complete lesion of the cord there was periodic reflex micturition in each. None had paralytic incontinence.

Lesions of the cauda equina were present in fourteen cases in which there was marked variation in the effect on micturition. Thirteen were of partial lesions. Of these, three had voluntary micturition and ten had retention followed by periodic reflex micturition in eight of the latter group. One case with complete lesion had retention.

Summarizing the variations in effect on micturition of injuries at different levels, complete retention occurs at first in all cases where micturition is affected, whether the injury is in the cauda equina or the cord.

Periodic reflex micturition is the second stage in all lesions of the cord and develops in more than half the cases of cauda equina lesions.

Urinary infection is the most common and fatal complication in paralyzed bladder. Of 111 cases at the Star and Garter Hospital and 339 cases at the King George Hospital, 19 at the former and 160 at the latter died of urinary infection.

Infection takes place early, the greatly distended bladder, presence of shock, and difficulties of asepsis of first catheterization render microbic invasion easy. The cystitis is particularly severe and in most cases is of the hæmorrhagic type. In a large proportion of cases ascending pyelonephritis results and is the cause of death in the majority of fatal cases of gunshot wound of the spine that survive the initial shock. Chronic septic pyelonephritis is a common type, with recurrent acute attacks. After a time chronic urinary septicæmia develops and the patient finally dies during an acute attack.

The treatment resolves itself into two chief lines: (1) provision for removal of the urine; (2) treatment of septic complications. During the stage of retention the urine may be disposed of by periodic catheterization, by a tied-in catheter, or by suprapubic cystotomy.

Periodic catheterization is the universal method, usually three times daily until periodic reflex micturition is established. The tied-in catheter resorted to in a number of cases was found unsuited for treatment of retention in paraplegia, because of the development of purulent urethritis and the danger of perineal abscess and urinary fistula, or sloughing of the urethral wall. Local treatment of the bladder consists in washing the bladder with a solution suited to the particular case, an acid wash

to dissolve phosphatic débris of alkaline cystitis, or an alkaline wash to clear away the thick, ropy mucus of acid cystitis.

Alkaline cystitis forms the majority of cases and a boric acid wash is most frequently used. Acetic acid, a dram to a pint of water, in powerfully alkaline cases will help in the removal of phosphatic débris. It should be followed by the boric acid. In acid cystitis normal saline solution, potassium permanganate 1:8,000 solution, peroxide of hydrogen 1 in 20 of 10 volumes, silver nitrate 1:10,000 solution are useful. Chlorine preparations are intensely irritating and should be used with caution, 1:20,000 solution at first cautiously increased.

Internally sodium bicarbonate, potassium citrate, and acetate, and the diuretic alkaline waters are helpful in acid cystitis.

In alkaline cystitis, sodium acid phosphate 4 to 8 drams daily or sodium or ammonium benzoate, 10 to 20 gr., three times daily may be given until the urine becomes acid.

Of the urinary antiseptics boric acid is best when the urine is alkaline and urotropine when the urine is acid. Sandalwood oil is useful in soothing the inflamed mucosa in the early stage of acute cystitis.

Vaccine treatment has proved of value in the treatment of chronic cystitis of paraplegia. As a measure to prevent the cystitis and frequent ascending pyelonephritis in cases of gunshot injury of the spine, the author recommends early suprapubic cystotomy for drainage to take the place of catheterization, as one catheterization may be sufficient to cause the whole damage of cystitis and pyelonephritis. It is suggested that suprapubic cystotomy be done at the earliest possible time and the bladder drained continuously until the second stage of active incontinence is reached. The advantage hoped for is that as there is no tension on the bladder there will be no tendency toward ascending infection.

H. G. HAMER.

Geraghty, J. T.: The Rôle of the Seminal Vesicles in Persistent Non-gonorrhœal Infections of the Posterior Urethra and Bladder. *J. Am. M. Ass.*, 1917, lxxviii, 757.

The causative influence of chronic infection of the seminal vesicles in the perpetuation of posterior urethritis and inflammation of the trigon is probably not as generally recognized in relation to non-gonorrhœal as to gonorrhœal infection. The infection may assume the form of a bacteriuria, with occasional exacerbations in which a visible amount of pus can be detected, and with periods of more or less urinary irritability; or there may be a frank cystitis at varying intervals. Even during the periods of remission there is usually evidence of infection in the urine.

As to the somewhat difficult subject of diagnosis, in the presence of epididymitis, particularly of recurrent epididymitis, the diagnosis of active infection in the vesicles is reasonably certain. Palpation may reveal unmistakable changes, but in a

surprisingly large percentage of cases in which there is an active process palpation gives equivocal findings. Yet this is our chief source of diagnostic knowledge, as in the presence of infection in the posterior urethra the finding of evidence of infection in the expressed vesicular secretion is utterly valueless. Again the presence of definite changes may be misleading, as they may be the result of a healed inflammation. Often the diagnosis must be made by a process of elimination, other sources of repeated infection not being discoverable. The colon bacillus is the most frequent infecting organism. Staphylococci were also found in the author's cases.

Six cases are included in the report. In each after a long course of treatment by non-operative methods seminal vesiculotomy was performed with gratifying results. It is suggested that where there is evidence of marked inflammatory thickening the incision of the vesicles is more apt to be followed by cure than are such procedures as injection with a silver preparation. In the more severe cases a simple incision does not assure adequate drainage, so in these cases it is better to excise a small piece from the posterior wall. In addition to drainage of the vesicles it is often advisable to incise the ampullæ of the vasa.

S. W. MOORHEAD.

Twyman, E. D.: The Two V-Flap — a Practical Circumcision for Children. *J Mo. St. M. Ass.*, 1917, xiv, 59.

Twyman describes a "two-V flap" method of circumcision in children which offers these advantages:

1. Removes the excess of skin and mucous membrane.
2. Prevents readhesion of the mucous membrane between the corona during healing.
3. Prevents phimosis or paraphimosis from a contraction of the scar.

The technique consists in freeing the prepuce, which is then pulled out past the meatus and clipped off by the scissors. A dorsal slit, in the skin only, forms a V on the dorsum. An inverted V is then made in the mucosa by cutting from the medio-dorsal edge laterally to the corona on each side, and this inverted V is fitted into the dorsal slit of the skin. The remaining mucosa is trimmed straight around under the frenulum, or in the shape of another V of the mucosa at this point. The frenulum is not cut. Four or five stitches approximate the cut edges.

The author claims that the operation can be performed without assistance and without any anæsthetic, in infants in from two and a half to three and a half minutes.

FRANK HINMAN.

GENITAL ORGANS

Keyes, E. L., Jr., and Mackenzie, D. W.: The Operative Treatment of Cryptorchidism. *J. Am. M. Ass.*, 1917, lxxviii, 349.

The authors describe in greater detail than has heretofore appeared in the literature this operation

which they claim is essentially that described by Bevan. They preface their description with the following statements:

1. The testicle retained within the abdomen is doubtless much more liable to teratomatous change than the normally situated testicle. The testicle retained in the inguinal region perhaps shows a similar though lesser liability to malignant disease.

2. Yet we find no evidence that the testicle which has been placed in the scrotum by operation is unusually subject to teratoma.

3. The retained testicle has often lost its spermatogenic function either by congenital deformity and obliteration of the epididymal tube, or by atrophy of the spermatogenic elements in the testicle itself. Such atrophy is not likely to occur before puberty in an organ otherwise normal and with normal epididymis only.

4. Hence there is every reason to operate at about the time of puberty in order to forestall atrophy. If the operation discloses grave deformity and separation of the epididymis from the testicle, the occlusion of the duct may be taken for granted. Yet this is no reason for not proceeding with the operation, since the testicle is doubtless safer from teratomatous malignant change and is certainly more decorative when in the bottom of the scrotum.

5. Almost every retained testicle is associated with either clinical hernia or with a pouching of the peritoneum, which predisposes the patient to hernia. The operation thus indicated for the cure of hernia is somewhat prolonged but not gravely complicated by the effort to replace the testicle in the bottom of the scrotum.

6. The safety of the operation is attested not only by the authors' series of 33 operations with no deaths, but also by similar statistics from other authorities.

7. Unless operation is called for by grave hernia at an early age it is safer not to attempt the procedure much before puberty, for the vessels are so small and delicate that they are likely to be torn unless the operation is unusually expert.

Certain exceptions to the usual technique of lengthening the cord may be encountered. These are:

1. The younger the patient and the smaller the testicle, the less developed is the cord likely to be and the more intertwined with muscular and fascial fibers, so that in such cases (and they constitute the majority) it is impossible to make a clean separation of the vascular elements from the fascial capsule without tearing many and perhaps all of the vessels. It will be found in such cases that fascial separation by snipping may be made here and there along the vessels and that a great deal of slack may be obtained by separation within the abdomen.

2. If the testicle is originally found near the internal ring or within the abdomen, it is usually necessary to divide the pampiniform plexus, although atrophy will doubtless result from this, in order to bring the testicle down to the bottom of the scrotum.

3. If the testicle is at or near the external abdominal ring the slack obtained in the veins is usually greater than that obtained in the vas, so that there is no reason to divide the pampiniform plexus.

4. If, in spite of a deep dissection within the pelvis, the vas remains too short, about 1 cm. may be gained by displacing it to the inner side of the internal epigastric vessels. It has been suggested that the vessels be cut for this purpose, but we have found it perfectly feasible to perforate the fascia to the inner side of the internal epigastric vessels without cutting them, and to slip the testicle through the opening thus made. So far as the authors are aware no hernia has resulted from this procedure.

5. Retention of the arterial supply is of the utmost importance, and it will sometimes be found that the artery of the vas short-circuits, as it were, a loop of the vas itself, so that in order to save the vessel the unfolding of this loop must be omitted.

6. In four cases all of the vascular supply of the testicle was apparently destroyed, only the vas remaining to connect it with the body. Yet in only one of these cases did sloughing result. The others were considerably atrophied already and there is no evidence that they atrophied further. I. S. KOLL.

Thomas, B. A., and Harrison, F. G.: The Bacteriology and Microscopy of the Contents of the Seminal Vesicles Postmortem; a Study of Fifty-two Cases. *J. Urol.*, 1917, i, 59.

The perivesicular form of spermato cystitis leading to a chronic infiltration of the trigone and neck of the bladder may lead to symptoms of prostatism; in one case there was a residual urine of fifteen ounces. Postmortem findings in a considerable number of cases showed the trouble to be atrophy, obliterative changes, and inflammatory enlargement of the vesicle.

It was seldom that the gonococcus could be identified; the vast majority of cases presenting a mixed infection. Postmortem study failed to demonstrate gonococcus in a single case.

The content of the inflamed vesicles is a mucopurulent or purulent material mixed with a pellucid filamentous stroma or colloidal brownish liquid containing conglomerated fat globules, desquamated and degenerated epithelial cells, pus, erythrocytes, lecithin granules, concretions, bacteria, and possibly spermatozoa.

A table of the 52 cases shows that in over 40 per cent, a spermatozoa occurred in the presence of evidence of inflammation, either bacteria or pus or both. Obviously, the zoosperms were all dead. In 14 cases exhibiting signs of spermato cystitis, or approximately 27 per cent, no spermatozoa were discoverable. F. R. O'NEIL.

Stokes, A. C.: Report of Fifty-Two Cases of Seminal Vesiculitis. *J. Am. M. Ass.*, 1917, lxxviii, 759.

Malaise and headache were present in practically all of the cases; pain in different regions was noted

154 times. Other symptoms frequently noted were intermittent discharge, 39 cases; frequent urination by day, 12 cases, and by night, 34 cases; sexual aberration, increased desire, 16; decreased 10; epididymitis, 15 cases. The laboratory findings were: sago bodies, 38 times; sugar bodies, 8 times; skins, 10 times; staphylococcus, 36 times; diplococcus, gram negative, 18 times; diplococcus, gram positive, 12 times; colon bacillus, 6 times; pus in every case; blood, 10 times; lecithin bodies in every case.

In most of the cases there was uncertainty as to whether the pus came from the vesicles or from both the vesicles and the prostate; in one case the prostate had been removed.

Vasostomy was performed 11 times, and the Hagner operation for epididymitis 8 times. The vesicles themselves were operated upon 8 times. These cases are reported in detail. In doing vesiculectomy the author proceeds from below upward. He concludes:

Seminal vesiculectomy is rarely indicated, and should not be done except in those cases in which there is an empyemic vesicle with signs of general sepsis and no tissue destruction.

On anatomic and pathologic grounds the operation of drainage of the seminal vesicle cannot remove the disease in chronic cases, and the pathologic condition will return when the wound has healed.

In all chronic infected vesicles with a series of chronic symptoms, if after proper medical and mechanical treatment and vasostomy it becomes necessary to perform such a major operation as draining the vesicle, the removal of the supraprostatic portion of the vesicle adds such a small degree of operative risk that it is justified in practically every case in which such extreme methods are necessary.

Seminal vesiculitis as a simple clinical entity is exceedingly rare, and the diagnosis is difficult and rarely made, because sufficient attention has not been directed to this infection.

Treatment of the seminal vesicles alone has imperfect and incomplete results. The other urethral adnexa which are infected must be treated at the same time. S. W. MOORHEAD.

Herbst, R. H.: Seminal Vesicle Infection as the Cause of Persistent Urethral Discharge; Report of Cases. *J. Am. M. Ass.*, 1917, lxxviii, 761.

The posterior urethra becomes infected in over 75 per cent of cases of gonorrhoea, and in most, if not all, of these the ejaculatory ducts and subsequently the seminal vesicles become involved. Inasmuch as spontaneous healing of infected vesicles is a rarity, and local treatment, such as stripping, is curative in only a small percentage of cases the question arises, When is surgical intervention indicated?

This question is not answered, but five cases are reported in which, in the presence of a profuse urethral discharge, sometimes intermittent in character, sometimes associated with epididymitis, vasos-

tomy was performed and collargol, in the strength of 3 to 5 per cent solutions, and in quantities of from 6 to 12 ccm. injected, the urethral discharge disappearing shortly thereafter, and the suggestion is made that infected vesicles be attacked directly.

S. W. MOORHEAD.

Brickner, W. M.: Prostatic Calculi; Calculous Prostatitis. *Urol. & Cutan. Rev.*, 1917, xxi, 61.

Prostatic calculi are generally divided into two groups: (1) those in the prostatic urethra; (2) those in the gland proper.

1. Calculi in the prostatic urethra are described as (1) those formed higher in the tract, lodging in the deep urethra (These, obviously, are not prostatic stones.); (2) those formed in pouches or diverticula of, or in communication with, the prostatic urethra. It seems very doubtful that these stones do so form as a rule. Instead of forming *de novo* in a urethral pouch, it seems more likely that a stone thus located has, passing down from the bladder, merely found lodgment in this portion of the urethra and there formed for itself a pocket or, perhaps more often, that it is a true prostatic calculus extruding into the canal and thus occupying a cavity primarily glandular rather than urethral, in other words that the pouch is the result, not the cause of the stone. A calculus thus protruding from the prostate may, by accretions of urinary salts, "mushroom" into the urethra or bladder as an "hour-glass" or "collar-button" formation.

2. In the prostate gland a single, fairly large stone may form. Much more commonly, however, prostatic calculi are small and multiple. Sometimes seen in the prostatic urethra is the so-called "prostatic sand"—minute, dark, calcified corpora amylacea.

At any rate, when prostatic calculi have formed, inflammatory changes take place in the gland-fibrous tissue growth and sometimes, suppuration. Clinically, therefore, as well as pathologically, we must have in mind the conception not merely of calculi in the prostate but of a calculous prostatitis. The symptoms which vary considerably, both in character and severity are pain, either of a continuous aching character or, more often, intermittent, referred to the perineum, the testicle or the inguinal region, and sometimes aggravated at stool. Such pain can be traced to its source only by a systematic examination of the urine, the anus, and rectum, the prostate and other genital organs, the inguinal rings and, if need be, the urethra and bladder. The pain may be referred to the tip of the penis and associated only with micturition either before, during, or after the act. Hæmaturia, usually terminal, may be produced by a stone projecting into the prostatic urethra or the bladder. Whether hæmaturia may be produced by calculi wholly within the prostate gland the case reports do not make clear.

Such a purulent process may, in these cases, produce a spontaneous urethral discharge. Hence, if

pus containing no gonococci is found in the prostate fluid of an individual who has for years been free from any local infection a calculous prostatitis should be suspected.

Upon rectal palpation the stone-bearing prostate may be found of normal size and contour and not unusually sensitive, or it may be enlarged, irregularly nodular or lumpy and exquisitely tender. "Lumpiness" and great tenderness are very suggestive, but by no means diagnostic of stones, since they may arise from other conditions. If crepitation of the concretions is felt by the examining finger this is diagnostic.

A metallic sound passed into the urethra will encounter a stone extruded or extruding from the prostate, but the sensation is of surface contact only rather than the distinct click often imparted by a calculus free in the bladder, which is of suggestive value, at least in differentiating the two, and the doubt can be further resolved by cystourethroscopy—which is indicated in a case with any of the above symptoms not otherwise satisfactorily explained.

Roentgenography, which is an important part of the diagnostic examination, will reveal calculi if they be present. If the shadows are quite small, numerous, and discrete it is a fair presumption that they are produced by prostatic rather than vesical stones. But these small shadows may be so conglomerated as to give the appearance of a single, large, bladder stone; and unless he be very wary the roentgenographer will so interpret the picture. If a roentgenograph of the unemptied bladder, exposed with the patient in the level supine or reversed Trendelenburg position, shows a shadow or group of shadows in the region of the neck of the bladder, and a second roentgenograph, exposed with the patient in the Trendelenburg position and the X-rays passing in the same relative direction, shows the shadow in the same place as before, the stone or stones are fixed in the prostate or the prostatic urethra or in a diverticulum behind the prostate. Air inflation of the bladder also will show the upper border of the prostate roentgenographically.

The author advises that an X-ray film be placed in the rectum to enable one to differentiate between prostatic and bladder stones. For treatment the author recommends endoscopy for the small stones, for the larger ones the perineal operation, taking particular care that the pouch in which the stone rests is obliterated. Where the stones are complications of adenomatous enlargement they may be removed along with the enlargement.

V. D. LESPINASSE.

MacGowan, G.: Cancer of the Prostate. *J. Am. M. Ass.*, 1917, lxxviii, 521.

While admitting the value of the careful research work done by Hugh Young and his collaborators, according to whom cancer of the prostate, in most instances, develops from the group of glands lying between the submucosal urethral tissues and the

posterior lobe, the author insists that primary foci of carcinoma may develop in any anatomic portion of the gland as well as in atrophied, apparently normal, and hypertrophied prostates.

In the absence of a definite, unvarying, and finely marked symptom-complex, characteristic of cancer of the prostate, the diagnosis must be largely made by exclusion. Of minor differentially diagnostic import are chronic parenchymatous prostatitis, long continued low grade deep-seated abscess, primary tuberculosis, stone and sarcoma of the gland. Most important is differentiation between simple hypertrophy and cancer; the most characteristic criteria of the latter being bone of ivory hard consistency, and adherence of tumor-masses to the surrounding parts. The differential diagnosis between prostatic atrophy of the glandular and muscular tissue of the prostate, resulting in loss of elasticity in the prostatic urethra and contracture of the bladder neck, is only feasible on the basis of microscopic examination of slides obtained from tissue removed by the punch.

As regards frequency of prostatic cancer the author considers about 20 per cent, or one case in five, an approximate figure. The disease apparently has no age limit. MacGowan's youngest patient was 17 years old, and a number of cases have been recorded in persons past 80.

The most striking complex of clinical symptoms, presented by malignant involvement of the gland, the author sums up as follows:

When retention supervenes on vesical irritation in months instead of years, after difficult and painful urination, mostly at night, when infiltration bullet-like, board-like, leather-like, or ivory-like is found in the prostate of a man who presents no symptoms of active syphilis or tuberculosis, and whose blood gives a negative Wassermann reaction; when the capsule of the gland has become adherent to the anterior pelvic fascia of Denonvillier, and the perirectal fascia, but the rectal tissues are no longer movable on it and it has lost its motility in the pelvis, and the prostatic image to the sense of touch has become blended with that of one or both of the seminal vesicles, without the presence of acute inflammatory symptoms; when the central groove is blurred or lost, in the anterior two-thirds of the prostate to the finger examining through the rectum over a steel instrument in the urethra; and added to this is loss of strength, pain in the back, pain in the rectum, oedema of the lower extremities, and neuralgia along the course of the sciatic, obturator or crural nerves, it is safe to make the diagnosis of cancer of the prostate."

Urethroscopic examination of the posterior urethra is a valuable diagnostic aid. While size of the prostate is no criterion of diagnostic value, small hard, painful prostates, occurring in men in the fifth and sixth decades of life, should always be viewed with suspicion. Also abnormal tenderness and pain in the rectum without the presence of other causes should give rise to apprehension. Metastases

often occur early to the lymphatics and bones in men past 45. Any swelling of the lymph-glands or persistent ostalgia without a clear picture of lymphocytosis, pernicious anæmia, Hodgkins disease, tuberculosis, local infection or syphilis, should cause investigation of the prostate for cancer. Oedema about the penis, the rectum, or the lower extremities, if accompanied by pelvic pain and vesical irritability, is significant of primary cancer of the prostate causing metastasis to the pelvic lymph-glands and pressure on the iliac veins.

The time for the diagnosis of prostatic cancer is while the growth of the carcinoma is still contained within the capsular walls of the gland, a desideratum which, unfortunately, can only rarely be fulfilled. In such cases an early performed prostatectomy, either suprapubic or perineal, with complete removal of all the glandular elements, may, if properly performed, give good permanent results, as ascertained by the experience of Freyer and Albarran and Halle, who have not seen more than 3 to 5 per cent recurrences after their early prostatectomies done in intracapsular cancers. When this early stage has passed, the choice has to be made between as complete enucleation, or dissection, as possible, conducted suprapubically, and subsequent fulguration, or Young's conservative partial prostatectomy. In rare selected cases total removal of the prostate and its capsule with the urethra beyond the triangular ligament and the anterior two thirds of the trigon may be attempted.

Catheter life or permanent suprapubic fistula with a de Pezzer self-retaining catheter *in situ*, connected with a glass bottle are recommended for relief of inoperable cases.

The results obtained by the local application of radium do not seem to the author to warrant its recommendation as a therapeutic agent in prostatic cancer.

Finally, the author presents a table of his own observations, containing valuable data upon palpatory, cystoscopic, and clinical findings as well as upon operative results and postoperative metastases.

M. KROTOSZYNER.

Judd, E. S.: Some of the Principles Involved in the Treatment of Patients Suffering from Obstructing Enlargement of the Prostate. *Interst. M. J.*, 1917, xxiv, 70.

Prostatectomy usually consists, not in the removal of the entire gland, but in the enucleation of the new-growths, the firm capsule being left intact.

According to most investigators, adenomatous hypertrophy of the prostate occurs in about 60 per cent of all men more than 50 years of age, though it is said only about 34 per cent of these men have symptoms which require treatment. Judd reviewed the histories of one hundred consecutive cases of men more than 50 years of age admitted to the clinic with general complaints other than genito-urinary. The rectal examination showed a palpable enlargement of the prostate in every

case. Of these men, 65 were between the ages of 50 and 60 years, 14 between 61 and 65, 9 between 66 and 70, 7 between 71 and 75, 5 between 76 and 80. On a basis of 1, 2, 3, and 4, 44 had a relative enlargement of 1 (i.e., though slight, it was easily recognized); 41, an enlargement of 2; 8, an enlargement of 2+; and 7, an enlargement of 3. In this series it was not possible to determine any definite relation between the enlargement and the age of the patient. The analysis of the urine in 59 of the 100 cases was negative; 36 showed pus; in 19 there was a history of Neisserian infection. It is probable that in some of these cases the enlargement of the gland was inflammatory. In 5 cases the urine contained casts; 36 had nocturia; 17 were obliged to get up on an average of once each night, and 19 two or more times each night. Forty-two had no evidence of trouble from the enlargement; 14 complained of some difficulty in starting the stream and of frequency in cold weather; a few complained of dribbling. With the gradual increase in the growth of the gland, there is usually an increase in the amount of residual urine. The problem becomes serious when the point is reached at which the amount always remaining in the bladder is from 8 to 10 ounces. The effect of residual urine has never been definitely shown, but there is no doubt that its complete and permanent removal is often very serious and sometimes fatal. It was this feature which years ago caused the high mortality following prostatectomy. We have long known that a patient who has been catheterizing himself for some time is a much better risk for prostatectomy than one who has not. It is hard to say just why patients become uræmic on withdrawal of the residual urine. Necropsies upon patients who have died under these circumstances have almost invariably shown the cause of death to be an acute nephritis superimposed on the chronic condition. It would seem that the most feasible explanation of what takes place is this: During the time the obstructive process has been developing, the amount of residual urine has been relatively increasing and there has been a back-pressure into the bladder, which sometimes dilates the ureters and extends up into the pelves of the kidneys. This pressure has increased so gradually that the patient has become accustomed to it. In some instances there are apparently no organisms in the urine, though the infection probably exists in the tissues at the time. Removing the obstruction takes away all the back-pressure. In all probability this would not be serious so far as the bladder and ureters are concerned, but in the pelves of the kidneys it makes almost a negative pressure, so that the blood-vessels and the tissues of the kidneys which have been compressed in this way are released and much more blood comes into the latter than was there formerly. In this manner congestion of the kidneys is produced, which, when severe, results in acute nephritis.

Another theory is that during the time the residual urine is in the bladder there may be some absorp-

tion from it into the general circulation. Accordingly, when the residual urine is withdrawn, absorption ceases. Judd has tried to counteract this effect by giving several urinary constituents to patients who showed symptoms of reaction after the withdrawal of the residual urine, but their condition was not relieved. This latter theory was suggested by the fact that often in the reaction following the removal of residual urine, patients present many of the characteristics of morphine addicts who are denied morphine. While there is considerable question as to just what this reaction is, there is absolutely no doubt that it exists, and it is almost certain to occur when the residual urine is withdrawn.

The treatment should be divided into two stages. In the first stage the residual urine should be withdrawn gradually and infection of the bladder cleared up as far as possible. The first stage of the treatment is always followed by some reaction. Usually there will be some general depression, loss of appetite, restlessness, and nervousness. The best index to the reaction is the specific gravity of the urine, which is always much lower during this stage of depression. Practically every patient has a period of depression, and it is noteworthy that the specific gravity of the urine and other findings correspond very closely to his general condition. In reviewing the preparatory stages of 50 prostatectomies, the author found that the course was identical without exception. In all there was a sudden drop in the specific gravity, accompanied by malaise, loss of appetite, vomiting, irritability, and sometimes uræmia. This first stage usually lasts from three days to two weeks, and is followed by a slow, gradual rise in the specific gravity and gradual improvement in the general health. General irritability disappears and appetite returns. The patient feels better than he has for years. During the preparatory treatment there is always a fall in blood-pressure; it is not uncommon to see it come down 30 to 40 points in two or three weeks.

As soon as the reaction from the preparatory treatment has subsided, a prostatectomy may be performed with comparative safety. It is obvious that to operate without preparatory treatment brings the period of depression in the first few days after operation—the time of greatest danger from the operative work. If the patient has weathered the period of depression beforehand, he has little or no reaction at the time of the second stage of the treatment; i.e., the removal of the enlargement.

Occasionally a patient was seen who suffered no reaction in spite of the fact that there was considerable residual urine; on the other hand, there were some patients with a small amount of residual urine who had a very severe reaction during this preparatory treatment. Although it is probable that infection plays an important part in causing the reaction, the author has been unable to demonstrate it. Patients whose urine shows no evidence of infection, either at the beginning of or at any time

during the treatment, frequently seem to be the ones who have the most severe reaction.

In 50 cases the average specific gravity at the first catheterization was 1016 while at the time of greatest depression it was 1006. Therefore, in the average case, it dropped ten points from the beginning of preparation to the height of depression. The figures indicate that the average specific gravity at the time of operation was 1011, a rise of five points from the time of greatest reaction. In many instances the preparation was continued over a number of weeks until all the evidence of reaction had disappeared. In a very few instances Judd observed a return of the specific gravity to what it was at the time of the first catheterization, in spite of considerable improvement in the patient's general condition compared with what it had been four months previous.

The change in the blood-pressure during the period of preparation would seem also to indicate a change in renal function during this period. Apparently patients with a high systolic pressure will stand operation well, but, if the diastolic pressure is high, especially if it is out of proportion to the systolic, their chance of withstanding surgical procedure is not nearly so good. The average systolic pressure in these 50 cases was 166; during preparatory treatment this average dropped 21 points, so that it was only 145. A part of this change may be attributed possibly to the loss of appetite and lessened activity. However, in spite of the fact that the patients returned to a normal diet and free exercise, the blood-pressure did not return to its former high point.

The phenolsulphonephthalein test of the function of the kidney averaged 40 per cent, which, in the author's experience, is a safe limit in these cases. The highest functional result was 60 per cent and the lowest was 12.5 per cent. Of course the risk would be great in operating on a patient whose return was only 12.5 per cent unless everything else was favorable. The functional test is very important in determining the operability. It must, however, be borne in mind that an infected kidney may show a high return, and for that reason a good output does not necessarily mean a safe operation, though a low test would indicate considerable risk in operating.

Data in regard to the specific gravity of the urine of 25 patients under preparation showed that at the beginning of their treatment the average specific gravity was 1015. After eight or nine days of preparation it dropped to 1004, and, although preparation was continued for nine weeks, it never again became more than 1009. At this point, however, the patients were considered good risks for prostatectomy.

In conclusion Judd states that preparatory treatment is of the greatest importance in all bladder and prostate cases. Preparation should be accomplished by urethral catheterization as far as possible. If this procedure does not accomplish the desired

results it will be necessary to institute suprapubic drainage, and then wait until the reaction subsides before attempting prostatectomy. Sometimes it has seemed that the reaction subsided a little more quickly with suprapubic drainage than with urethral catheterization. Suprapubic drainage has, however, the added danger of infection and a very severe reaction. The two-stage treatment described will reduce the mortality considerably.

J. DILLINGER BARNEY.

Legueu, F.: Results in Prostatectomy Under Local Anæsthesia (Resultats de l'anesthésie locale de la prostatectomie). *J. d'uro.*, 1914, vi, 601.

In June, 1914, Legueu published the results of 14 prostatectomies executed under local anæsthesia, this being the first application of a new technique. Since then the number of cases has much increased and a report is now given of the results of 150 operations of this kind.

Before operation a subcutaneous injection of 0.01 centigrams of morphine is made to diminish the patient's excitability. A solution of 50 ccm. of novocaine to which is added 5 drops of adrenalin for each 100 grams, is injected into the bladder. Anæsthesia of the bladder wall is not sought; injection is limited to the cavity of Retzius and this with the intravesical injection obviates any painful sensation on incision. When the bladder is opened the inter-recto-prostatic region and the anterior zone of the urethra are injected with the needle.

Anæsthesia is excellent and Legueu has never been obliged to administer a general anæsthetic. The quantity of anæsthetic used is about 1.25 to 1.5 grams of novocaine and 250 to 300 grams of the solution. This includes the amount injected in the bladder. There has never been any immediate or end trouble from the anæsthetic. In the first trials a larger quantity of adrenalin was used, but Legueu attributes a slight necrosis of the celluloadipose tissue, observed in a few cases, to this and has reduced the amount.

As regards results, in 150 prostatectomies there has been a mortality of 5 per cent. This is the lowest mortality which Legueu has had and he attributes it to the anæsthesia. Chloroform gave him a 10 per cent mortality. Local anæsthesia therefore saves from 5 to 6 per cent of the patients, besides it makes the after-course easier, hastens recovery, and makes it possible to perform operations on patients whose complications will not permit the use of general anæsthetic.

There are two conditions which appear to Legueu especially contra-indicated to local anæsthesia, viz., bladders sensitive owing to cystitis or calculus, and sclerous prostates without adenoma. A sensitive bladder cannot be overcome by a local anæsthetic. With a sclerous prostate Legueu in the beginning found the results so poor that he abandoned the use of local anæsthesia.

W. A. BRENNAN.

MISCELLANEOUS

Koll, I. S.: The Transplantation of Fat in Prostatic and Kidney Surgery. *J. Am. M. Ass.*, 1917, lxxviii, 536.

The laboratory experiments were carried out on dogs. The kidneys were traumatized, nephrotomized, and decapsulated. Free transplants of fat were implanted in the traumatic defects and into the incision. It was in every instance very striking to see how promptly the bleeding stopped. Some of the transplants were infected with bacillus coli, and some with staphylococci.

After removing the prostate, the resulting cavity is filled with a pad of fat which is anchored to the edges of the mucous membrane. The fat may be obtained from the abdominal incision of the patient or better still from a dog. Fat when kept on ice in a normal salt solution, in air-tight containers, may be preserved indefinitely.

Those areas into which fat has been transplanted show within three to four months a metaplasia of reticular connective tissue, then becoming fibrous. Infections do not alter the metaplasia, though they delay it.

H. A. KRAUS.

Eisendrath, D. N., and Schultz, O. T.: Lymphogenous Ascending Infection of the Urinary Tract. *J. Am. M. Ass.*, 1917, lxxviii, 540.

An emulsion of sterile salt solution and scrapings of four agar cultures of the organisms bacillus coli, staphylococcus aureus, and bacillus proteus were injected into the bladder. The cultures taken from the urine before the experiments were sterile in all cases.

Cultures were immediately made of the heart's blood, both kidneys and bladder. All of the blood-cultures in 26 of the first series of experiments and 13 of the second were negative. In the latter series the organism was found in the bladder in two animals but never in the kidneys.

The ureter and renal pelvis showed evidences of involvement of varying degree in every dog. The most marked reactions occurred after the bacillus coli, and the least after staphylococcus aureus, those of bacillus proteus being between these. Common to all experiments was the intact condition of the lining epithelium of the urinary tract.

The inflammatory changes followed the course of the lymphatics to the renal pelvis in such a large

number of experiments that the authors no longer doubt that the lymphatics, especially the ureteral lymphatics, are the most important path of ascending infections when pyelitis or pyelonephritis follows cystitis not associated with complete obstruction to the urinary outflow.

The article is accompanied with three charts, one showing the relation of the lymphatics of the ureter to the internal genitalia of the female, and two showing the effects upon the lymphatics of the injections of bacillus coli and bacillus proteus.

H. A. KRAUS.

Lespinasse, V. D.: Sterility Studies, with Particular Reference to Weak Spermatozoa. *J. Am. M. Ass.*, 1917, lxxviii, 345.

To satisfactorily diagnose and treat sterility it is essential that it be considered a dual problem, involving both husband and wife. In determining the cause of sterility of a given couple it should be considered under the following heads:

1. Obstructions in the sexual tract of the male.
2. Obstructions in the sexual tract of the female.
3. Absolute failure of, or imperfect development of, the essential male elements.
4. Absolute failure of, or imperfect development of, the essential female elements.
5. Alterations in the secretions of the female sexual tract so that her secretions are destructive to the life of the spermatozoa.

Each of these heads is then considered in detail with the following conclusions:

1. Many cases of sterility attributed to the woman are due to weak spermatozoa.
2. This type of case can be diagnosed by careful examination of the semen, as has been described in the foregoing.
3. The cause of sterility is as often in the male as in the female, if not oftener.

Treatment depends entirely on the cause.

Obstructive cases, male or female, are operative.

Weak sperm cases would indicate direct uterine insemination and glandular therapy, diet, modes of life, etc.

Secretion cases necessitate appropriate therapy to check or modify the destructive secretions.

Non-production of the essential elements, namely, spermatozoa or ova, would indicate glandular therapy.

I. S. KOLL.

SURGERY OF THE EYE AND EAR

EYE

Krusius: Results of Ocular Sutures in Recent Wounds of the Eye (Les résultats des sutures oculaires dans les plaies récentes). *Ann. d'ocul.*, 1917, cliv, 166.

Krusius gives the results observed from the study of eye lesions observed in one of the German ophthalmological stations at the front.

The first group included 34 cases of noninfected wounds of the globe without foreign body. Immediate result 100 per cent. No infection. The end-results were: vision preserved and no irritation in 31 cases, 9 with more than $\frac{1}{10}$ of acuity and 22 with less than $\frac{1}{10}$. Thus 88 per cent had a lasting result. There were 3 cases of blindness. Four eyes were removed for fear of sympathy.

This group was composed of 62 per cent scleral, 30 per cent limbus, and 8 per cent corneal wounds. Twenty-seven foreign bodies were successfully removed, 23 of steel and 3 of copper.

The second group comprised 13 eye-lesions with preserved vision but infected; some of them with enclosed foreign body (7 scleral, 5 limbus, 1 corneal). Immediate result: 12 infections arrested; 1 evisceration for panophthalmia. The end-results were: irritation in 8 cases, 4 cases preserving the sight; 13 positive extractions of foreign bodies.

The third group included 18 recovering operations on eyes not yet blind to preserve their forms: (17 per cent scleral, 17 per cent corneoscleral, 66 per cent corneal). The immediate results were: absence of infection, 83 per cent; panophthalmia, 17 per cent. The end-results were: 3 eviscerations for panophthalmia; non-painful stump, 23 per cent; eye having a luminous perception, 60 per cent.

The fourth group consisted in diascleral evisceration for a sunken and blinded eye. The immediate result was: absence of infection 100 per cent. The end-result was: painless stump not offering any danger of sympathetic ophthalmia, 100 per cent.

W. A. BRENNAN.

Ribas Valero: Endo- or Extra-ocular Sarcoma (Sarcoma endo- o extraocular)? *Prog. clin.*, Madrid, 1917, v, 92.

The author discusses a case of enucleation with evisceration in the left eye for a tumor, the intra-ocular or extra-ocular nature of which was a matter of difference of opinion.

Microscopic examination of sections of tissue of the fundus showed a small nucleus of embryonic cells developed in the thickness of the sclera. This neoformation was of sarcomatous type. It was evident that one of the larger nuclei had undergone

a myomatous evolution, but in spite of its dark color the tumor was not melanitic.

The author discusses the case with a review of the literature for the purpose of calling attention to the possibility that an extra-ocular tumor can evolve by penetrating into the interior of the eye following a path inverse to that habitually taken.

W. A. BRENNAN.

EAR

Friesner, I.: Differential Diagnosis Between Purulent Labyrinthitis and Cerebellar Lesions. *J. Am. M. Ass.*, 1917, lxxviii, 339.

The following differential points are mentioned: 1. Headaches, very rarely present in uncomplicated labyrinthitis, are invariably present in cerebellar lesions.

2. With cerebellar lesions there may be disturbance of the sensorium, disturbance of respiration, bradycardia, optic nerve changes, paralysis of cranial nerves, none of which, with the exception of disturbances in the eighth nerve and occasionally in the seventh, ever occur with labyrinthitis.

3. Vomiting, while present in both, is never projectile in type when due to labyrinthine disturbance, but always associated with nausea.

4. There is never much elevation of temperature in uncomplicated purulent labyrinthitis.

5. The spinal fluid is normal in uncomplicated labyrinthitis.

6. With cerebellar lesions there may be hypermetria, asynergy, adiadosokinesis, tremor, disturbances in speech, atony or hypotony, catalepsy, hæmi-paresis, and fixed attitude of head. None of these occur with labyrinthitis.

7. As to the falling phenomena, the direction of falling is changed according to the position of the head, i.e., always toward the direction of the slow component, when of labyrinthine origin; direction of falling unchanged in cerebellar disease.

8. Deviation of extremities, past pointing, has same significance as falling.

9. In labyrinthine suppuration there is loss of hearing, loss of reaction to caloric, rotation, and fistula tests, etc. In cerebellar disease there is "enduring nystagmus."

10. Nystagmus, if vertical, points to cerebellar disease, otherwise it has no localizing significance.

OTTO M. ROTT.

Stone, C. L.: Diagnosis and Treatment of Lateral Sinus Phlebitis. *Long Island M. J.*, 1917, xi, 61.

The unusual case reported by the author was that of a boy four and a half years old, in whom the pres-

ence of a sinus phlebitis was not recognized until there were undoubted symptoms of general sepsis, because of the total absence of any sign of ear or mastoid involvement. At the first examination, when the only symptom was vomiting, there was noticed a glandular swelling in the posterior triangle of the neck. A diagnosis of acute gastric indigestion was made. Three days later elevation of temperature was first recorded, and the patient was dull and photophobic. One week after the onset of the vomiting, the picture was that of a meningitis and a lumbar puncture was made. Headache did not appear until the following day and in the region of the swollen glands there was a puffy oedema. On the next day the patient had a chill, temperature 105°. The swelling in the neck had extended upward over the base of the skull reaching from the occipital protuberance to the mastoid. Just posterior to the mastoid over the region of the emissary vein there was considerable tenderness. An incision was made slightly posterior to the usual mastoid incision and extending downward over the swelling in the posterior triangle. Free pus was found in this latter region, and the bone over the sinus was found to be soft and necrotic. The mastoid cells and antrum were normal, with the exception of a few cells overlaying the sinus. The sinus contained a clot, which was removed, but no free bleeding was obtained from the region of the bulb. The jugular vein, however, was not touched as the condition of the patient was too serious. The patient died thirty-eight hours later.

After discussing the importance and difficulty in making a diagnosis of sinus phlebitis before the onset of the complications of general sepsis or brain abscess the author reviews the various tests supposed to determine any interference with the normal flow of blood through the sinus. They are:

1. The West-Beck symptom which consists in the production of distention of the veins of the forehead and the fundus oculi on compression of the jugular opposite to the suspected lesion. The author considers this test almost worthless as the effect is so transient and its recognition so dependent upon the personal equation of the observer.

2. Greisenger's symptom, i.e., swelling over the emissary vein of the mastoid. The author quotes authorities who state that in reality the puffiness over the emissary vein region is not a sign of venous obstruction but is due directly to the presence of pus under the periosteum, and is therefore a late symptom, hence this also is an unreliable sign.

3. The recognition of a clot in the jugular on deep palpation over the vein. However, the danger of dislodging the clot and causing immediate death thereby, renders this test a very hazardous one.

4. Blood counts and blood cultures are of assistance in excluding other possibilities. A blood count is of aid in ruling out typhoid and malaria. The advantages of blood cultures are thus set forth: (a) With few exceptions, uncomplicated mastoid infections give negative blood cultures. (b) With

few exceptions sinus infections give positive blood cultures at some time during their course. (c) The absence of bacteria in doubtful cases would lead one to hesitate to explore until the possibility of all intercurrent disease had been excluded. As regards treatment, the author favors exploration in doubtful cases and should a clot be demonstrated, he favors preliminary ligation of the jugular vein in preference to resection.

OTTO M. ROTT.

Dunlap, A. M.: Repair of the Tympanic Membrane in Perforations of Long Standing. *Laryngoscope*, 1917, xxvii, 81.

Dunlap reports a series of fifteen cases of perforation of the membrana tympani treated successfully with trichloroacetic acid for the purpose of stopping repeated attacks of otorrhoea, not with the idea of improving the hearing.

Two important factors should be taken into consideration in determining the interval to elapse between treatments: (1) the amount of scar tissue which makes up the edge of the perforation; and (2) the vitality of the ear drum itself.

Neither the size of the perforation, nor the age of the patient materially affected the final closure of the perforation and the hearing was considerably improved in every case. The only factor which seems to interfere with a successful treatment is the entire absence of a definite drum membrane at some point in the circumference of the perforation.

ELLEN J. PATTERSON.

Palen, G. J.: Focal Infection in Aural Disease. *J. Ophth., Otol. & Laryngol.*, 1917, xxiii, 116.

The author believes that the percentage of systemic infections from aural conditions is equally as large as that from the tonsils or the sinuses and teeth, the actual increase in the number of systemic infections from the latter being due to the greater number of sinus and teeth foci in comparison to the aural diseases.

Infection from aural conditions takes place (1) by drainage into the throat through the eustachian tube; (2) through the blood or lymph systems; (3) by extension to surrounding structures, the general infection resulting from the secondary condition; (4) by formation of a secondary focus.

OTTO M. ROTT.

Pierce, N. H.: Involvement of the Labyrinth by Way of the Ductus Endolymphaticus. *Ann. Otol., Rhinol. & Laryngol.*, 1916, xxv, 881.

In illustration of this unusual mode of infection of the labyrinth, the author reports a case of serous labyrinthitis resulting in a serous meningitis, occurring in an acute otitis media, 27 days after the mastoid operation and 52 days after the onset of the ear trouble.

As factors pointing to this mode of infection the author reasons as follows:

The labyrinth is involved scarcely ever through the semicircular canals in acute otitis media ex-

cept in cases of acute mastoiditis occurring in the course of severe scarlet fever and in cases where there is a gaping of the external semicircular canal. Inspection of this canal failed to reveal any changes. The other canals were also excluded as gateways of infection, as there was healthy bone lying between them and the softened fistula which led to the posterior surface of the temporal bone and extended directly to the meninges which were very close to the situation of the aqueductus vestibuli. The author does not think it possible that the infection could have occurred by way of the foot-plate of the stapes, or the fenestra ovalis, as the ear was drained thoroughly both by paracentesis through the tympanic membrane, and posteriorly into the mastoid wound. The same is said of the promontory.

If there had been gaping of the external semicircular canal, which is very rare in adult life, or gaping in the promontory, which is still more rare, the symptoms of involvement of the labyrinth would have occurred much earlier.

In conclusion the following points are emphasized:

1. The saccus endolymphaticus may be involved more frequently than is usually supposed in acute softening processes of the mastoid.

2. It is necessary in all cases of mastoid involvement without external manifestations except temperature, to search very thoroughly for softened areas deep down in the bone, until healthy structure is found.

3. It is important in suppurative labyrinthitis not only to open the bony labyrinth, but to explore the saccus endolymphaticus region.

4. Within the first few days serous labyrinthitis cannot be differentiated from suppurative labyrinthitis by any diagnostic means at present at hand.

5. Absence of globulin, presence of lactic acid, absence of sugar, may be noted in inoffensive serous meningitis.

6. In these three cases viable micro-organisms were not recovered from the cerebrospinal fluid which apparently is the only differentiating point between spreading suppurative meningitis and serous or circumscribed meningitis.

7. Several lumbar punctures were made in the course of the week following the appearance of meningeal symptoms; that is, whenever the headache, stiffness of neck, and temperature increased. The punctures were invariably followed by improvement as evidenced by decrease in headache, stiffness of neck, and temperature.

OTTO M. ROTT.

Clay, J. V. F.: Etiology of Chronic Suppurative Otitis Media. *J. Ophth., Otol. & Laryngol.*, 1917, xxiii, 230.

Besides the cases which are chronic from the start because of the nature of the causative agents,

as for instance a tuberculous or aluet infection, and those which are chronic because of the general debilitated condition of the patient, there are local etiological factors which render an otherwise simple or acute otitis a chronic one. Such factors are some local nasal or nasopharyngeal abnormality, as septal deformities, hypertrophied turbinates, nasal polyps, collapse of alae nasi, chronic suppurative disease of accessory sinuses, diseased adenoids, adhesive bands in the fossa of Rosenmueller, and diseased tonsils.

OTTO M. ROTT.

Ingersoll, J. M.: The Interpretation of Stereoroentgenograms of the Mastoid. *Cleveland M. J.*, 1917, xvi, 1.

Ingersoll made stereograms of both mastoids of a prepared skull. The semicircular canals of one mastoid were uncovered and copper wires inserted to identify them. The various landmarks could thus be familiarized by alternate study of plates and skull. These, and also stereograms of the living, should be studied first as from the outside and then with plates reversed.

The location of the lateral sinus can be clearly seen and its depth below the cortex can be determined with considerable accuracy. The size and position of the mastoid antrum can usually be definitely seen. The amount and character of the infection in the mastoid can be determined.

Normal mastoid cells transmit the roentgen rays better than inflamed cells and slightly inflamed cells transmit the rays better than cells filled with granulation tissue and pus, hence in normal mastoids the cells and their walls and the underlying structures can be distinctly seen. With only a mild inflammation the cells all look less distinct. If the mastoid antrum and cells are filled with granulations and pus, the area thus involved shows much less distinctly. If the walls of the cells have been broken down by the suppuration and are necrotic, the pictures show an exceedingly dull area.

In several cases areas of slight dullness in the brain have suggested brain abscess and the operative findings have confirmed the diagnosis. In some of these cases a second stereoroentgenogram was taken before the gauze packing was removed from the abscess cavity, and the position of the brain abscess thus definitely localized and the diagnosis verified. By careful study and comparison of such plates, made before and after the operation, much valuable information can be gained and, as skill and experience in interpreting the plates increase, diagnosis of brain abscesses can be made with increasing certainty.

Stereoroentgenograms of the mastoid give much valuable accurate information which cannot be obtained in any other way.

DAVID R. BOWEN.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Johnson, A. E.: Submucous Resection of the Nasal Septum. *Internat. J. Surg.*, 1917, xxx, 69.

After reviewing the etiological theories and symptomatology of deflected septa, the author mentions a few points of technique which he prefers to others:

1. Anæsthesia by means of applying cocaine "mud" made by the mixture of cocaine flakes in adrenalin.
2. Initial incision always on the left side.
3. First incision immediately down to the cartilage.
4. Begin dissection high up with blunt dissector and go backward and then downward.
5. Packing used, unless in the presence of a pre-existing sinus suppuration. Otto M. Rott.

THROAT

Hayden, A. A.: Simplified Surgical Tonsillectomy. *Chicago M. Rec.*, 1917, xxxix, 151.

The author uses general anæsthesia in all children under eight years of age. Above that age the individual temperament of the patient is the deciding factor.

The original feature is the author's method of dealing with hæmorrhage for which he has devised a pillar needle and pusher.

The soft palate is drawn forward, the threaded needle is introduced behind the posterior pillar opposite the bleeding point and passed deeply through it, catching the floor of the fossa, then toward the anterior pillar. Here the needle stops and with the pusher the pillar is pushed down over the needle. When the eye of the needle comes into view the hook on the other end of the pusher catches the thread, which is pulled through while the needle goes back through its original tract carrying the other end of the suture. The suture material is iron-dyed silkworm. In twenty-four hours the stitch is removed and the pillars separated by gently passing an instrument between. Otto M. Rott.

Dworetzky, J.: Clinical Pathology of Tuberculous Laryngitis. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxv, 803.

The author has observed and studied one hundred cases of laryngeal tuberculosis from a period of three months to two years, and has carefully noted the affected parts in detail. Only those cases that presented a laryngeal lesion without doubt, and only those that offered an opportunity for a complete

examination, were included in this study. Otherwise the cases were not especially selected.

From this study the author concludes:

1. A clear conception of the nature of a lesion is of the utmost importance. Without it it is impossible to prognosticate and treat a disease scientifically.

2. The character of the lesions is one of the chief determining factors in the prognosis.

3. In tuberculosis of the larynx the pathology does not differ in any way from the pathology of tuberculosis of the lungs.

4. There are three distinct types of laryngeal tuberculosis: (1) acute, (2) subacute, and (3) chronic.

(a) The acute type is characterized by a soft oedema of the larynx with a marked tendency to ulceration. There is little or no tendency to fibrosis, and it therefore takes an acute course. Nodules, consisting of tubercles can often be seen projecting above the surface of the mucosa. When the tubercles caseate, they give rise to ulcers. (b) The subacute type is characterized by a pseudœdema of part or parts of the larynx with a moderate tendency to fibrosis. Papilliform infiltrates and soft polypoid excrescences usually belong to this type. (c) The chronic type is characterized by firm infiltration of part or parts of the larynx, and the diagnosis, as a rule, is easily made. On the other hand, cases of the chronic type very seldom suffer from annoying symptoms, and only on close scrutiny can the lesion be detected.

5. The frequency with which a part is affected is in direct proportion to the amount of trauma that part receives as a result of its location and its functional activity. The above is fully corroborated by the results of the study presented, in which it is shown that the most frequent site of involvement is the interarytenoid space, followed in order of frequency by the vocal processes, arytenoid cartilages, vocal cords, ventricular bands, aryepiglottic folds, and epiglottis. Otto M. Rott.

MOUTH

Blair, V. P.: The Present Status of the Treatment of Carcinoma of the Mouth in This Locality. *J. Mo. St. M. Ass.*, 1917, xiv, 101.

Blair's data was obtained from a series of fifty cases of cancer of the mouth, coming under his observation between January 1, 1912, to June 1, 1916. Most of these cases came from within an area of one hundred miles of St. Louis.

Of these cases, the early, that is before demonstrable infiltration of cells, comprised 12 per cent

the medium, designating definite cancer, requiring lymphatic removal, but in an early stage, 24 per cent: far advanced, 30 per cent: non-operable, 26 per cent. All but one were squamous epithelial tumors. Blair claims that each of these growths had existed in a form that should have excited at least the suspicion of a cancer for periods varying from two weeks to thirty-six months before coming under his observation.

From his experience, the author concludes that to the two factors usually considered in the curability of cancer, the time at which the treatment is instituted, and the character of the operation, we must add a third, viz., the virulence of the growth. *

FIFTY CASES OF CANCER OF THE MOUTH BETWEEN
JAN. 1, 1912, AND JUNE 1, 1916

	No.	Inoperable	Far Advanced	Medium	Early
Lower lip.....	11	3	2	6	..
One cheek.....	8	1	4	2	1
Both cheeks.....	1	..	..	..	1
Upper jaw.....	3	2	1	..	..
Palate.....	1	..	..	..	1
Lower jaw.....	8	3	4	1	..
Floor.....	3	..	1	1	1
Tongue.....	13	2	7	2	2
Tonsil.....	2	2	..	..	..

He believes that there is present for some time before actual cancer development, the lesion that is known to predispose to such growth. In one of these cases there had been a chronic fissure of the lip for twenty-five years, and leukoplakia, the most common antecedent, is often present many years before cancerous changes occur. Cancer of the lip, he thinks, is not infrequently preceded by an injury or a herpes.

In thirty-two cases, which included the medium grade, far advanced, and inoperable, radical cure was done or attempted by one or several operations. In all, 52 operations were done upon these 32 patients, an operative death rate of 21 per cent resulting.

Of his series, Blair believes 16 per cent incurable by present methods, though some of these might have been saved by education and good surgery. In the remaining 84 per cent the majority should have been recognized at a time when the operative death rate should be almost nil, and the cures at least around 70 per cent; however, an improvement has been noted in recent years.

The author decries the fact that late diagnosis is the rule; in almost every case sufficient data is present at the time of the first examination to render the diagnosis of cancer, at least, presumptive.

Some interesting points are brought out by a study of Blair's series. One is that, with one exception, the history and gross physical character-

istics are sufficient data upon which to base a diagnosis from the very early stages of the growth and that microscopical findings, unless cautiously interpreted, may be fatally misleading. The practice of removing a piece of a mouth ulcer for microscopic examination is, in itself, not free from the danger of disseminating the disease. If the whole growth cannot be removed, then a section should be taken with an electric cautery. The use of irritants has an evil effect upon cancerous growths. The author calls attention to three cases of recurrence in the nodes of the neck after cure of the primary ulcer of the lip.

Emphasis is laid upon the evil of procrastination and pernicious treatment. The public should be advised to consult the physician or dentist in regard to every localized thickening, discoloration, crack, or ulceration that appears within the mouth and which persists for more than a few days.

E. C. ROBITSHEK.

Vitto-Massei, R.: A Case of Cavernous Angioma of the Uvula and Palate (Su di un caso di angioma cavernosa dell'ugola e del palato). *Arch. ital. di laringol.*, 1917, xxxvii, 1.

Angioma of the palate and pharynx is rare. A short review is given of the cases collected from the literature. In the otorhinolaryngologic clinic at Naples out of 44, 642 patients registered from 1882 to 1916 this condition was only observed twice.

The author reports the case of a man of 25 years, in which a diagnosis of fibro-angioma was made and the tumor removed. The patient fully recovered. Histologically the tumor was found to be a cavernous angioma. It was about the size of an adult thumb.

W. A. BRENNAN.

Blomfield, J. E.: Some Notes and Thoughts on Parodontal Disease. *Practitioner*, Lond., 1917, xcvi, 165.

Contemporary with an increase of appendicitis, there has been an increase of parodontal disease during the last three or four decades, due to infections from food, and dental manipulations, etc.: consequently every effort should be made to avert the spread and incidence of the disease.

The earliest stage of the disease is not easily recognized because it arises in the interdental spaces, but when found should be treated. While the disease remains on the surface of the gums, it is amenable to simple measures without extraction of teeth, but untreated, it is a life-long disease which may produce no symptoms or be responsible for toxæmia of varying severity under depressing influences.

ELLEN J. PATTERSON.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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COLLECTIVE REVIEW

THE PRESENT STATUS OF RADIUM

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IN reviewing the literature upon radium, one is forcibly impressed by the difference of opinion between the various writers. In the same journal may be found an article praising radium in the most laudable manner, while, beside it, will appear another, equally forceful in its condemnation. It is difficult to account for this discrepancy; except that the methods of application are so different as to give wide variation in results.

On account of the great expense involved, it would appear that radium will never become a widely used medicament. Furthermore, its use is purely empiric, and, so far, it has not proved a specific for any distinct malady. These two factors then lead to but one conclusion, that radium should be employed in institutions of large means, where all influence of commercialism shall be divorced from its employment, and where skilled assistants can be employed in the various departments needed for its manipulation. Only under such a régime, as suggested, will the best results be obtained. All large centers should possess a radium institute modeled after that in London, or of the Manchester district, and, while this country has several institutions that are doing very good work, they are not established upon the broad principles of those just cited. The medical journals contain many reports of cases but little attention has been given to some important facts governing the underlying principles which should be brought to the notice of the profession in general; therefore, this review will deal largely with these points rather than with case records.

APPARATUS

The credit for the employment of the emanation of radium instead of the radium, must be given to the London Institute. Their method of obtaining it has been rather complicated and required the employment of liquid air for the separation of the remaining gases. This method has been greatly simplified by Dr. William Duane (48), and his method, or a slight modification of it, is being employed by several institutions at the present time. Here the emanation is purified by a series of tubes containing phosphorous pentoxide and potassium hydroxide connected with a tube containing a coil of copper wire, which is heated by an electric current, and from the time the emanation leaves the solution until it is enclosed in the small tube for use, it never leaves the apparatus, thus avoiding the collection of the emanation over mercury, as is necessary with the old apparatus. Furthermore, Duane's method opens the possibility of employing the emanation and the "active deposit" not only as a local agent but it can be so prepared that it is possible to use it internally.

One objection raised to the employment of the emanation is that a measurement must be made of every tube or combination of tubes when they are made, and a calculation of all degenerating values considered with each application. This requires one skilled in physics of radium, and is attended with some degree of danger from insidious burns, which often follow the handling of these active materials. This subject has been fully considered in an article by Dr. Thomas Ordway (145). The advantages gained by this

method fully compensate for its attendant risks and justifies its recognition.

Where it is impossible to obtain suitable laboratory facilities we must adhere to the employment of radium contained in small tubes or upon small flat plaques; and, while the radiation from these sources is constant, there is always the danger of their loss, as has been reported upon several occasions (9, 220, 222). Whereas these tubes and plaques have a wide range of flexibility by the arrangement of different filters or combination of the several different tubes, they lack the wide range of those made from the emanation. Besides, where a flat application is desired, a small piece of metal of any given size and shape is placed within a small glass tube, which is sealed to the emanation apparatus, then the "active deposit" is deposited upon it, which is regulated accordingly, from a very small amount up to the limit of supply. It is then removed, and placed upon a suitable backing (adhesive plaster) and applied directly to the part to be treated. If the low radiation is not desired, suitable filters must be used. Furthermore, it must be remembered that the life of this application is extremely short and it must be used immediately. If low radiation is not desired, it is possible to use the old emanation tubes spread upon a flat surface which will be of service for several days.

Another form of application brought out by Duane's (48) method is the small trochar (Manchester has also claimed this method) (35, 199). The glass tube containing the emanation is placed within a small steel tube, to which a screw point is attached; into the hilt may be screwed several varieties of handles or a ring to which a ligature may be attached. This form of application is of value where it is desired to place the radioactive element within the mass of a tumor, thus avoiding free cutting, which at times is not desirable. If, on the other hand, the sharp needle point is not desired, it is only necessary to unscrew it and replace with a blunt end.

Another form of flat application for the employment of emanation, has been brought out by the General Memorial Hospital in New York. It consists of a small block of lead with a number of small holes drilled in it. In these holes the emanation tubes are placed, and it is then covered by a jacket of aluminum. It is of value in "cross-firing," especially where some compression is desired.

Many forms of application have been devised, each meeting the individual requirements of the operator, for a particular field (14, 79). Some require a high degree of skill to apply, and, while

they take many forms and shapes, especially those devised to apply radium within the bladder, rectum, or other cavities, the essential details are that the container should be safe for the radium, and furnish a proper degree of filtration.

FILTRATION

In the treatment of all conditions, except those on the very surface of the body, filtration is desired, but there seems to be very little uniformity of opinion in regard to just how it shall be accomplished. This, no doubt, is due to the different amounts of radium used by different authors; and yet, with all this wide variation the uniformity of results that has been observed and reported is singularly odd. In a general way, it might be stated, where large amounts of radium have been employed, for instance over 100 mg. radium element, the usual amount of filtration employed appears to be about the equivalent of 3 mm. of lead; while those employing smaller amounts from 10 milligrams up, employ from about 0.1 to 1 mm. lead or equivalent. This refers mainly to radium employed in tubes for deep penetration and treatment of tumors. Abbe has recommended air filtration; that is, the radium tube is placed at the apex of a lead cone two or three inches high. The cone is usually filled with cotton. This mode of application is based upon the fact that the low rays of radium are to a great degree obstructed by two or three inches of air, but it must also be remembered that the high rays lose in value according to the rule "inversely as the square of the distance." For this reason this method has serious objections and it would appear that it would be much better to cut off this low radiation by some means of filtration, such as lead, than to cut off the secondary radiation of the lead by a few layers of paper or gauze, and bring the radium into as close proximity to the part to be treated as possible; thus losing less of the value of the radiation as a whole. Another point in favor of Abbe's method is that the farther away the source of radiation is the more nearly parallel are the rays. This is of value where a mass is to be "cross-fired" but can be met by the proper screening of these rays by cones.

The exact value of different metals used as filters is still undetermined. There is no doubt that the secondary radiations of various metals differ; that some give a relatively high secondary radiation, others a much lower; at the same time differing in amount; but as all metals do give off this secondary radiation all should be covered with some organic material, which will, to a great

degree, eliminate it. Small celluloid cases are valuable; or the applicator may be covered with celloidine, which can be easily applied and may also be removed. Where it is not practical to employ this form several layers of thin sheet rubber may be employed.

INJURIOUS EFFECTS OF RADIUM

Every one employed in the laboratory or in a position to handle these radio-active elements, radium or thorium, should be fully instructed as to the dangers and warned to observe any peculiarity of any of the functions of the body. Instructions should be given never to handle any radio-active material, but to use forceps made especially for the purpose. These forceps should have long handles so that the activity will be held as far as possible from the body. The ordinary surgical forceps with a soft spring and the ends covered with thin soft rubber tubing make a very good all around instrument, although a special forceps has been devised by Viol (210).

One of the first signs of injury from these radio-active materials appears about the finger nails. The "quick" becomes tender and rough, and is especially sensitive to heat and cold; if this is allowed to continue, the ends of the fingers will become smooth and lose their furrows. This condition is accompanied not only by this hyperæsthesia, but also by a loss of sensation, which gives rise to clumsiness, and the person will find considerable difficulty in picking up small objects such as pins or in turning leaves of a book. There apparently is a wide difference of personal equation; some individuals being far more susceptible than others. If the disturbance advances farther the nail and skin undergo greater change, and repair is doubtful. Similar conditions have been observed by Pinch (156) and Ordway (145). General changes in the system have been reported by Gudzent and Halberstaedter (67); they consisted in the change of the blood picture, impairment of genital glands, lassitude, drowsiness, headache, and attacks of vertigo. Lymphocytosis was marked in all cases, while the neutrophils dropped. With these changes were associated the usual changes in the skin alluded to by other observers.

It should be remembered by all workers in the field of radio-activity that the greatest permanent harm is done the individual by long continuous exposure; the process is insidious and the early symptoms are not acute, and therefore are not alarming, but in the end the lesions produced are most intractable and their repair is difficult if at all possible. This is in direct contrast with

the acute condition, and while the results are in themselves serious, they are usually ushered in by all the signs and symptoms of acute inflammation. While the detrimental results from the radio-active elements thus far reported have not been of as severe grade as roentgen burns yet they closely simulate them, and it is to be expected that in all probability they will occur.

COMPARISON OF RADIATION BETWEEN THESE ELEMENTS AND THE ROENTGEN RAY¹

The radiation given off from an active Crook's tube consists chiefly of roentgen rays of varying degrees of penetration, from very low to very high, depending upon the style of tube and the conditions under which it is employed. These radio-active elements give off three kinds of rays: the α -, or *alpha*-rays, which need only be considered in the internal administration of these elements, and while it represents 90 per cent of the energy, it is useless on account of the lack of penetration; the β -, or *beta*-rays, represent about 9 per cent of the energy and to a great extent may be employed in radiotherapy. Lastly, the γ - or *gamma*-rays, are the most useful on account of their great power of penetration, but these details have been explained elsewhere.

There is no unanimity of opinion upon the subject of the usefulness of the individual rays, especially as to their physiologic effects. Some (160) contend that anything which can be accomplished by radium can be done with the roentgen ray; needless to say there are others who hold a contraposition. Kelly (90) states that radium therapy is analogous to X-ray therapy with the striking difference that radium is far more potent and is less likely to cause irritation to the sound tissue. Even granting that both forms of radiation are equal, the different modes of application must necessarily give different results, for instance, if a given mass is to be radiated, and radium is placed directly within the mass the greater part of this radiation is directly spent upon the mass, while the normal tissues surrounding it receive only a small degree of the radiation. Should this mass be treated from without the radiation must necessarily pass through normal tissue before it reaches the desired point. This is modified to some extent by the modern "cross-fire" method. At the same time instances have come under observation, where one method has failed while the other has produced results. Even in cases where the roentgen rays and radium have been applied from without, one will occasionally observe in-

¹ (Ref. 40, 67, 82, 101, 117, 168, 190, 200.)

stances where the condition will yield to one operator and not to the other. Several peculiar cases have been observed where the skin over the area of the spleen and the long bones has been exposed to the roentgen rays without any definite result, while radium, on the other hand, gave quite a marked reaction with diminution in the splenic tumor. Similar results have been reported under reversed conditions.

The difference in the application of the radiation in these instances may possibly be explained by the fact that the roentgen rays are applied over an extensive area for a short period while the radium is applied to a limited area for a longer period, and this does not take into consideration the difference in the quality of radiation. A case of lymphatic leukæmia and a lymph-granuloma were reported by Hirschfeld, where the application of radium and thorium succeeded and the roentgen rays failed to exert any influence.

Efforts have also been made to use the different rays of radium but their process of separation is too complicated to be of any practical value (11). However, considering the physical difference between the β - and γ -rays of radium, it might be supposed that their physiologic effects upon tissue would be quite different.

THE COMBINED USE OF RADIUM AND ROENTGEN RAYS¹

A number of articles have been written discussing the use of roentgen rays as an accessory to radium in the treatment of deep-seated disease; the contention being that radium will prove useful only as a local agent, and where a wide field must be covered and considerable depth of tissue must be penetrated, the roentgen rays are to be preferred. In fact, it has been stated that the "roentgen ray has been found to be the only agent which is capable of checking and permanently curing well-established malignant growths in which extensive involvement has taken place, although radium is far superior in its local action on any mass situated in cavities, where it is necessary to concentrate the rays." (26) While it would appear that this statement has many supporters the results from combined treatment will be far more satisfactory than when one or the other has been employed alone (82). It seems doubtful if the roentgen rays can be given the credit of being the only useful agent in widely scattered malignancy. The type of disease and its dissemination are of great importance, not to mention the personal susceptibility to the individual form of radiation; and while this last point

has been denied by some well-known dermatologists, others have observed it. Furthermore, it is difficult to explain how the same patient treated by the same individual, under both methods, shows such widely different results.

EXPERIMENTAL OBSERVATIONS²

Some interesting observations have been made upon the effects of radium upon cellular life, both vegetable and animal; and the more recent experiments appear to confirm those of an earlier date where, in general, small amounts were stimulating, passing upward as the dose was increased until the stimulus gave away to depression and death. These facts are of value for the reason that should a growth be radiated it must be remembered that there may be a portion of it that receives only a small percentage of this radiation and not sufficient to cause fatigue.

There also appears to be some evidence to establish the fact that healthy tissues are more resistant than diseased tissues; yet, at the same time, it must be remembered that there is a wide difference between the various tissues of the body. Attention has been called to the fact that great care must be observed in the treatment of disease in close proximity to bone, lest a periostitis be caused, with severe inflammatory disturbance which is likely to be followed by considerable necrosis.

DOSAGE³

With all the clinical and experimental evidence upon this subject, it is most difficult to decide the exact amount of radiation required to produce a given result upon any one pathologic process. The actual amount of radiation delivered to any one part is so influenced by the factors of filtration, and kind of filtration, that these two points must always be considered. There is one fact however, calling for some emphasis, e.g., a number of authorities contend that results are obtained only by the use of a large amount of radium element. The fact is that while there are some cases demanding heavy dosage, there are others that will do better under long continued or often repeated small doses. A number of cases have come under observation where treatment with large doses of radium has caused excessive sloughing of the part, and in others produced decided septic intoxication. Unfortunately, at the present time the matter of dosage must depend entirely upon the personal experience of the operator.

² (Ref. 69, 70, 71, 72, 91, 175, 182, 185, 199, 212, 216, 218.)

³ (Ref. 38, 61, 93, 200.)

¹ (Ref., 25, 26, 61, 75, 100.)

MALIGNANT DISEASE

There have been published in the medical journals within the last three years almost 200 articles dealing with the subject of radium in its relation to malignant disease, not including many where it is mentioned only cursorily. The opinions expressed differ widely. Some have stated that it is of very little value and condemn its use absolutely (165). Strange as it may seem this opinion has been voiced by many men of authority. On the other hand men of equal reputation have expressed themselves to the contrary, even so far as to state that it should be considered in some instances before operation (40, 119, 219). The greater number, however, are more conservative and express the opinion that radium is of distinct service under certain conditions where operation for some good reason, incident to the case, is impossible. From the review of these articles and personal experience, justification of its use must be considered under the different types of malignancy, as the result depends largely upon the rapidity with which the local disease extends and its tendency to metastasis. Those cases in which the process extends slowly and shows little tendency to metastasis naturally do well under radiation. Even the local process of the more rapid is often controlled; but, unfortunately, the disease, sooner or later, extends beyond the limits of radiation, to parts unforeseen, and will make headway before discovered. Even in these cases, however, it is possible to prolong life and give a remarkable degree of comfort, far beyond the natural course of the disease. These observations made from a clinical standpoint are supported, to a great extent, by experiments upon animals.¹

As yet, the justification of the routine treatment of malignant disease by radiation cannot be established. Some have advocated it, with these arguments in its favor: that radiation seals the channels through which these errant cells wander, at the same time causing no trauma to the parts, no open blood-vessels or disturbed lymph channels. These conditions at first sight appear to have considerable weight, but the conservative element in medicine regards this view as an element of great danger in the usual run of cases.

In the superficial epithelioma an exception must be granted. The results from the treatment by radiation have been so universally good, except in advanced cases, that it must be conceded that radiation should be the method of election. The great majority of these ulcerations appear upon

the face or the exposed portions of the body, where, for obvious reasons, a good cosmetic result is always desirable. Radiation practically destroys nothing except the undesirable tissue, and leaves the part sound, with a soft pliable skin of almost perfect glandular texture. Cases have come under observation where, after the ulceration had healed, the stitch marks of a former operation were plainly visible.

UTERINE CARCINOMA²

In a series of eight articles published upon this subject, no less than 705 cases were reported. The number could easily be augmented, but it serves to show the favor gained by this agent in the treatment of this particular disease. While the number of symptomatic cures has not been large, they indicate a decided advance. Furthermore, in those cases where it has not caused an actual subsidence of the disease it has given relief from hæmorrhage, a lessening of discharges, with more or less control of the pain. Many of these cases referred to in this list had had a previous operation and the recurrence left no other course open to the individual. Clark divides the cases into two classes: If the disease occurs in the body of the uterus it is usually localized; and as it does not, as a rule, give rise to early metastasis, operation is favored even if the disease is advanced. On the other hand, cases about the cervix, as a rule, spread to the pelvic glands much earlier, and for that reason, operation is not so favorable. In these cases radium will be found of value—even borderline cases should be radiated. Furthermore, he does not believe that operation should follow the use of radium on cases in which it has had a beneficial effect, as the change of structure due to the radiation makes operation difficult. As a palliative agent he has found it most useful in selected cases, but believes it dangerous from the unbounded optimism that it is liable to produce.

A number of reports have been made of cases where the disease had advanced beyond the limits of operation, which were treated by local radium applications and improved to the extent that operation was subsequently performed with success. This, however, is contrary to the opinion of Clark.

The employment of radium as a prophylactic measure after operation has been adopted by some. Schauta insists that small doses at brief intervals be employed directly following operation and that the intervals of exposure should be gradually lengthened. By this means, he believes that the

¹Colwell and Russ, Radium, etc., p. 257.

²(Ref. 5, 11, 12, 13, 17, 20, 27, 28, 35, 40, 45, 46, 47, 57, 60, 72, 77, 86, 88, 101, 102, 105, 106, 107, 109, 112, 121, 125, 126, 137, 150, 153, 154, 156, 158, 163, 168, 173, 179, 183, 195.)

probability of recurrence is lessened, but at the same time he calls attention to the dangers of the employment of too frequent and large doses. In cases where recurrence has taken place after a complete hysterectomy, if it has not made too great an advance, prompt and energetic treatment will usually be followed by a complete subsidence of disease.

It must not be forgotten that there are certain individuals who do not show this favorable response to the application of radium and not a few authors call attention to a certain number in their list who not only fail to respond but show a decided change for the worse. The radiation of the tissue sometimes causes a more active growth of the disease; and this must be remembered where radium is to be applied in early or borderline cases. While there are few who show this unfortunate exacerbation, still it occurs often enough to warrant precaution. The technique given by those reporting different series of cases varies to such a degree that it would be difficult to give any routine procedure without describing many methods. Here again is observed the same difference of opinion in regard to the amount of radium, filtration, time of application, time between applications, and the employment of the roentgen rays as an adjunct.

At the present time, it would be difficult to draw exact conclusions and while the results obtained from radiation of this disease have been remarkable, there is no reason why it should be regarded as a panacea.

MALIGNANT DISEASE OF OTHER PELVIC STRUCTURES

While the results from the local application of radium to other pelvic organs do not appear to be as good as in uterine disease, yet many reports, both single and compiled, are found which give some degree of hope. Shoemaker (188) reports a case of carcinoma of the urethra in a woman, the canal and contiguous portions of the bladder being involved. Great difficulty existed in passing the smallest sized catheter. Treatment was followed by recovery. Other cases involving the bladder (15) and vaginal wall (144) have also been reported. Good results have been reported where the disease existed in the lower end of the bowel and while the mucous tissue of the rectum appeared to be particularly sensitive to the action of radium (to which attention has been called by Doederlein, 46), even at times, quite annoying to the patient, yet it is possible to control the irritation by judicious filtration and not too free radiation. These symptoms have also been

observed in the treatment of prostatic diseases, particularly where the rectum is employed for one of the ports of entry for "cross-fire." Here to a great extent the irritation can be obviated by not allowing the radium to remain over the same site too long.

MALIGNANCY OF OTHER PARTS

Few reports have been made of successful treatment with radium of recurrent carcinoma of the breast (34), but the general opinion prevails that roentgen radiation in these cases is more likely to give favorable results. In malignant disease within the mouth, radium will occasionally give rise to considerable improvement even, at times, when the disease is quite advanced (136, 156, 176). Carcinoma of the tongue and of the palate have likewise occasionally improved. Where the structures of the larynx have been involved treatment by the "cross-fire" method has usually been employed, and even under these circumstances favorable results have been reported (19). It is difficult to explain why similar results should not be obtained by the roentgen ray; perhaps in the future, with the improvement of roentgen technique, this may be obtained.

The successful treatment, or at least temporary improvement of large internal tumors has been observed. Burnam (34) reports a retroperitoneal and mediastinal sarcomata, but there appears to be little, if any, gain upon those treated by the roentgen rays. A larger number of cures is accredited to the use of the latter, but this no doubt is due to the greater number of cases being treated by this method. The general opinion is that sarcomata seem to yield oftener to radiation than the carcinomata. This fact is difficult to explain, for, as a rule, the epithelial structures are more sensitive to radiation than are the fibrous elements.

In conclusion, there has been so much written upon this subject within the last three years that it would be difficult to do it justice here, and, while apparently there is strong opposition to radiation, yet there is a predominance of evidence from conservative writers favoring its employment.

It may be stated that where the disease is localized and has not given rise to a wide-spread metastasis, favorable results may be expected. Even in late cases marked temporary improvement is often observed. Under certain circumstances, as mentioned by Burnam (34), the employment of radium to circumvent an operation appears to be justifiable. For instance, "where

operation means great disfigurement and mutilation, as about the eyes, nose, or about the rectal or vesical sphincter, or some types of sarcomata that have not proved curable by surgery."

BENIGN TUMORS

The most important of this group are the uterine fibroids (2, 62, 87, 102, 125). Favorable reports have been made by a number of writers; some taking the advanced view that radium should be considered the method of election and should it fail, as it will in a few, operation for removal can then be considered. During the past year, four cases have come under observation where malignant disease followed the removal of a fibroid tumor; and yet operation has been recommended to circumvent this very condition. Had radiation been employed previous to the removal, no doubt this sequela would not have occurred. In all radiation was not deemed necessary after operation, as microscopic examination made by competent pathologists proved the tumors to be benign. The technique usually employed is to dilate the uterine canal; remove specimen for examination; and insert tube of radium, filtered as needed in accordance with the amount used.

Several reports of the successful treatment of tumors of the keloid type have been made, which caused not only the disappearance of the mass but also produced a good result from a cosmetic standpoint (3, 193). Moles and warts might also be included in this class (53). An unusual and unexpected report comes from Von Noorden¹ where it has also been used for the relief of hæmorrhoids.

In the vascular tumors (138, 148) there is no doubt that splendid results have been obtained in the treatment of nævi and their various forms; but there is every reason to believe that the reports have been exaggerated. While, in some instances, the original growth has been removed, keloids have formed upon the old site, and more often the telangiectasis, which is as distressing as the original mark, has followed some time after the nævi has disappeared. It must be remembered that these growths, where relief is sought, usually have formed upon the exposed surface of the body and therefore a good cosmetic effect is expected.

ULCERS AND SINUSES

Old sinuses, both tuberculous and non-tuberculous, have been treated with apparent success; and Cameron (36) has made reference to indolent wounds following injuries upon the battlefield. The radiation under these circumstances is supposed to cause a retrograde change in the granu-

lation tissues and to effect the organisms causing them to break down. Saphier (172) has also reported its employment in 21 cases of rebellious leg ulcers; in 10 it proved a success; 6 others were benefited; and on 5 it had no effect. It would seem that there are so many points to be considered in the treatment of a chronic leg ulcer that further confirmation is needed upon the subject.

DERMATOLOGY²

Reports of the use of these radio-active elements in the treatment of various lesions of the skin appear to justify its employment in the more chronic forms; and, while the greater number of dermatologists either employ or advise the employment of the roentgen ray, there are a few who appear to prefer radium. Clark, in his conclusions, states, "It is easier to estimate this single or massive dose, because we are dealing with a stable remedy emitting a constant radiation; its ease of application; while the disadvantage is the length of exposure and its high cost."

Attention should also be called to the fact that in many diseases like lupus vulgaris, psoriasis, and the chronic forms of eczema, the local processes will yield to radiation, but relapses are common, especially where the condition depends more or less upon some systemic disturbance. Again, attention should be called to those diseases of the hair, where the cure depends upon the depilatory effects of the rays, for should this action be too strong the loss of hair is apt to be permanent.

DUCTLESS GLANDS

Possibly the most important condition under this division is exophthalmic goiter (6). Abbe first called attention to the relief from symptoms and the diminution of the gland, following the application of radium, since that time his observations have been confirmed by others, and also similar results have been produced by the roentgen rays. There has been some contention, however, that radiation only partially relieves these cases and for that reason operation upon the gland is regarded as the only judicious method of treatment. This is offset by the fact that many of these cases are not suitable for operation, and complications sometimes follow.

In regard to other tumors of this gland and that of the thymus the same conditions prevail as in other organs and consequently call for no comment.

A number of observations have been made upon the treatment of splenic tumors (75, 183) with

¹Radium, Vol. vi, No. 2.

²(Ref. 191, 204, 205, 206.)

good results, especially in splenomyelogenous leukæmia (147). A case of polycythæmia (171) associated with which a greatly enlarged spleen showed a decided decrease in the number of red cells as well as diminution in the size of the tumor, symptoms such as headache, nausea, etc., were likewise relieved and while relapse followed the cessation of symptoms further radiation gave relief.

INTERNAL ADMINISTRATION¹

Quoting from Colwell and Russ, referring to radium emanation, "In spite of its chemically inert character, radium emanation, when present in any considerable quantity is by no means inactive toward the human subject." Everyone working with these active elements has observed the same symptoms: headache, nausea, malaise, and change in the blood and blood-pressure, which is supposed to be due to the radiation of the emanation. A similar condition has been observed by some from a massive dose of radium and X-ray; and, while this massive dose is usually applied only to a limited portion of the body from which these symptoms arise, it must be remembered that there is a powerful secondary radiation diffused through the whole body. Furthermore, the blood circulating through the radiated portion may also undergo some change.

The advancement of the internal administration of radium has suffered from several causes. Too much has been expected. It has been used in impossible cases, and complete restoration looked for. This is well illustrated in cases of arthritis, where it has been expected to restore joints already destroyed. In grave anæmias and allied diseases where the ultimate outcome of the case could only be a fatal issue, while giving temporary relief, complete recovery has been expected. That it should be of any use at all under these unusual and extraordinary conditions insures a promise that when it is better understood, in the early cases, under certain conditions, it will produce an alternative change and cause a general repair to the system. It has also been stated that even in those cases where radium was attended with good results formerly, sooner or later they relapsed. This also expresses the public attitude for it has been expected, should radium be employed and give relief, it must be permanent, in the class of diseases for which radium has been recommended after all the other drugs and methods of treatment have likewise failed. This view is unreasonable.

The method of administering radium internally at the present time might be divided into groups.

¹ (Ref. 21, 23, 54, 64, 76, 85, 122, 152, 157, 187.)

First: those who employ it as derived from natural sources, highly charged springs, where the patient drinks or bathes in a radio-active water or breathes the gas from it. This has been employed in central Europe to a limited extent. Second: the more universal method of employing water containing a soluble salt of radium or charged with the emanation. Advocates of both methods are equally sanguine as to results; but it has been maintained that water containing soluble salt of radium is apt to deposit active radium in the system, which is not eliminated. This assertion, however, has been refuted by the experiments of Voil, et al (186). On the other hand, on account of the very rapid elimination of the radium emanation from the body, it has a very brief period of physiologic activity. It must be remembered that the emanation is a gas and is subject to all the natural laws of physics; that while it is within the body it is constantly throwing off the "active deposit" of radium, which is a series of radium elements. These solids, although excessively small in quantity, must in turn be eliminated as other solids.

There have been a number of reports of the employment of these elements in the treatment of different forms of arthritis (rheumatic), gout, and various forms of anæmias, where more or less success has been claimed for these remedies. But a rather interesting observation has been made by Winfield Ayers (16), upon four individuals, all giving a persistent positive Wassermann reaction; after several intravenous injections of a solution containing radium, all gave a negative reaction.

CONCLUSIONS

1. There is very little evidence to show that radium or any of these radio-active elements will ever be a specific in the treatment of malignant disease, but it has been proved that it is and will be a valuable asset in the treatment of the individual malignant cases. Before considering the treatment of early cases either for the ultimate relief or as a pre-operative measure, it should be remembered that an occasional case will be observed where radiation will cause an apparent stimulation of the growth.

2. In superficial epitheliomata it should be considered the method of election.

3. There can be no impropriety in the treatment of non-malignant tumors by radiation, but it must be remembered that should operation follow, it is rendered somewhat more difficult, on account of the change in tissue structure caused by radiation.

4. In dermatology, radiation has proved

useful in the treatment of many widely different maladies, but its employment should be restricted to those cases where other means have failed.

5. The employment of radium or radio-active derivatives internally must be still considered in the formative stage and, while reports have come from a number of different reliable sources, further confirmation is needed before it can be accepted as a general remedial agent.

6. One of the most convincing arguments that can be offered in regard to the medicinal utility of radium, showing that it has passed the experimental stage, is the number of reports made in the American medical journals by American physicians.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Horsley, J. S.: Some Inconsistencies in Surgical Technique. *South M. J.*, 1917, x, 423.

A great source of bacterial contamination is the air. The usual operating room chandelier is liable to lead to dust infection. Although it is true that hands, even though encased in rubber gloves, should be kept out of wounds, often the bruising and crushing of tissue by means of steel forceps is more harmful. In intestinal work, especially on the lower bowel, the lumen should be disinfected if possible. Burying the stump of an appendix by the usual purse-string method is not only more complicated, but is more apt to be followed by infection, due to burying infected tissue in a blood poor cavity, more apt to cause adhesions, and more liable to diverticulum formation, than the simple ligation without invagination. In operations on cancer great care should be taken not to transplant cancer-cells. Bloodgood's statement should always be borne in mind, namely, that no cases of cancer of the breast, which have first been cut into for diagnostic purposes and then operated upon several days later have recovered.

R. B. BETTMAN.

Hepworth, F. A.: Toxic Symptoms After the Use of Bismuth Paste. *Lancet*, Lond., 1917, cxcii, 573.

Five men treated by the application of bismuth and iodoform paste showed symptoms suggesting plumbism. These cases occurred during a period of about four weeks during which time bismuth subnitrate was used instead of the routine bismuth subcarbonate. Four of the five patients developed a blue line on the gums and all were anæmic. Other characteristic symptoms of lead poisoning were not present. Unfortunately the bismuth subnitrate had all been used up before symptoms developed, so no test for lead could be made. Other samples of the subnitrate and subcarbonate from the same source were lead free. The author leaves it an open question as to whether or not these were cases of bismuth poisoning. He quotes from Sir Thomas Oliver's book on "Lead Poisoning" as follows: "A blue line on the gums, with difficulty distinguished from that caused by lead, may be observed in persons to whom large doses of bismuth have been administered by the mouth; or who, as the subjects

of empyema, have had injected into the fistulous track in their thoracic wall bismuth emulsion."

C. A. HEDBLÖM.

Cotte, G., and Dupasquier: Histologic Study of Two Attempted Homoplastic Skin Grafts (A propos de deux tentatives de greffes cutanées homoplastiques; étude histologique). *Lyon chir.*, 1916, xiii, 947.

The authors have made a histologic study of the evolution of two cases of attempted skin-grafting. In the first patient part of the scalp had been completely torn off. The graft was from a foetus dying during labor, and was removed about one hour after death. About 20 pieces of skin, normal in appearance, were removed and immediately applied to the patient's head. Dressings were gauze compresses treated with sterilized vaseline. All the grafts took. Some weeks later not the least fragment of the grafts remained. Resorption was without suppuration. The impression was conveyed that the grafts had melted away little by little. Twice during the evolution fragments from the area grafted were removed for histologic examination. The results show the mechanism of resorption. The considerable number of macrophages is evidence of the activity of the destructive process; they break down the epithelial barrier, dislocate the basilar bed, inundate the skin tissue and thus hasten elimination of the last vestiges of the graft. The existence of young connective tissue with scattered fibroblasts in some points shows the onset of reparation. With the graft entirely destroyed the reparative process will find the space free for action.

After this failure and other more ephemeral attempts the authors tried another way, viz., that of De Martigny who had published some remarkable results obtained by the transplantation of homogeneous skin preserved in a refrigerator.

The graft was removed from the thoracic region of a cadaver of a ten-year-old child that had died twenty-four hours before. Preservation of the cadaver was perfect. The technique followed was that indicated by De Martigny: iodine disinfection, immersion in Ringer's solution, and kept frozen for three days. The graft was applied to the head of the patient, the cellular tissue having been carefully removed and the patient washed with artificial

serum. Histologic examination of a fragment of the graft showed that the skin had a normal structure. Seven days later there was perfect adherence of the graft with the granular bed; but there was slight desquamation of the epidermis. Two weeks after this the graft showed signs of resorption. Ten days later it was reduced to a mere bluish pellicle. Microscopically, no vestiges of cutaneous elements were found, the whole space being filled with young connective tissue originating in the granular bed.

In the two cases the anatomoclinical phenomena show that whether it is a matter of a dermo-epidermic graft or a total cutaneous graft, the effects follow in the same way; when a histologically healthy strip of skin is grafted on a carefully prepared granular surface there is no delay in the taking of the graft as the penetration of vessels into its derma shows. However, shortly, under the influence of causes which the microscope does not elucidate, the graft dies and its resorption by leucocytes begins. At the end of twenty-five to thirty days resorption is much advanced; young connective tissue takes the place of the graft and effects cicatrization.

The authors, although they do not wish to doubt the results obtained by others, think that in some of the reported cases where the loss of substance is small, a neoformation originating from the edges of the wound has taken the place of the graft. The result is a clinical rather than a physiological success. Many of the cases published lack histological control and the authors have on this account thought it well to publish their own observation.

W. A. BRENNAN.

Brandao Filho, A.: New Method of Nephropexy (Nouveau procédé de néphropexie). *J. d'uro.*, 1917, vi, 631.

Although he has accepted Albarran's method of fixing the kidney as the best, the author still believes it has some technical inconveniences. Decortication of the organ, as much on the anterior as on the posterior face, results in adhesions easily forming between the anterior face of the kidney and the organs situated immediately in front of it, peritoneum, intestine, etc. Among other disadvantages, such adhesions interfere with good fixation, as they generally tend to pull the kidney downward. Another inconvenience to be avoided is the tendency of the vertical axis of the kidney to become horizontal by a basculated movement about the capsular pedicles. This is effected by not decapsulating the inferior pole.

A lumbar incision is made commencing about the level of the upper border of the eleventh rib. This is necessary in order to allow sutures to be passed over the eleventh rib. The first part of the incision should be vertical to prevent obliquity of the kidney when fixed. The reason is that the suture points are passed into the thoracolumbar wall in such a way that they are equidistant from the line

of incision; if this is inclined it is evident that the kidney axis will follow the inclination.

The kidney capsule is incised on the convex edge about 1 centimeter behind the median line. After incision the capsule of the posterior face of the kidney is separated, leaving covered only that part corresponding to the lower pole on the other side. By a median incision two pedicles are formed with the part of the capsule stripped from the posterior face, as in Albarran's method.

Two U-sutures are placed on the anterior capsule, the edge of the capsule being slightly pulled up by a forceps. These two suture points provide the means of adapting the kidney in the lumbar wall. The fixation sutures in the thoracic wall are placed, the upper in the twelfth rib and the lower in the sacrolumbar muscular tissue.

In the lumbar wall the upper supporting suture is passed in the eleventh rib. This is an indispensable precaution to avoid a bad position of the kidney by reason of the obliquity of the intercostal spaces; one of the threads is passed above the tenth rib and the other beneath so that when tied they bind this rib. The lower suture is passed in the muscles of the lumbar wall in front of the incision.

To fix the kidney, the suture points are attached to the corresponding points in the pedicles. Fixing the fatty capsule of the kidney on the muscle edges not only provides a kind of fillet to maintain the kidney but it also supports the ascending colon which often accompanies the kidney in its descent. The author has performed seven nephropexies by this method successfully. The results were highly satisfactory.

W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Taylor, K.: Action of Bacteria and Dressing Solutions on Catgut Ligatures. *J. Am. M. Ass.*, 1917, lxxviii, 1533.

The durability of catgut in suppurating wounds is of importance chiefly in connection with the use of ligatures for hæmostasis. Secondary hæmorrhage is a frequent complication of shell and rifle ball wounds and is a cause of a considerable portion of the deaths and amputations among the patients in many base hospitals.

Among the species of bacteria considered in the experiments, only one, the bacillus aerogenes capsulatus of Welch, attacked and eroded catgut ligatures.

None of the dressing solutions tested altered the tensile strength or elasticity of the catgut. One solution, the neutral solution of chlorinated soda, invariably caused slipping of the surgical knot, making it impossible to test the catgut.

The neutral solution of chlorinated soda would appear, from the experimental evidence, to be contra-indicated in cases in which important blood-vessels are exposed in the wound, and especially if such a wound shows an active infection by the gas bacillus.

EDWARD L. CORNELL.

ANÆSTHETICS

Baviera, V.: General Anæsthesia of Short Duration (Sulle anestesie generali di breve durata). *Clin. chir.*, Milan, 1916, xxiv, 1334.

For interventions of short duration, lasting for seven or eight minutes, the author has found it very advantageous to obtain general anæsthesia with ethyl chloride. Instead of using a large quantity and a special rubber mask complicated with valves, as is usual with this agent, the ethyl chloride is poured out on a compress which is placed over the face and particularly on that part of the compress between the nose and mouth. Only half the usual quantity is required to obtain complete narcosis. If it is necessary to extend the operation chloroform is used and the transference is effected without interruption or excitation.

A great advantage of the method is that any one can administer the narcotic because the quantity of narcotic used just suffices to put the patient to sleep, but is never lethal because the use of the compress allows contemporaneous inspiration of the atmospheric air. With the rubber mask asphyxia is violent and there is a period of intense agitation before narcosis; also a large quantity of anæsthetic is uselessly employed.

In the discussion the military surgeons who had used this method testified to its efficiency and innocuity.

W. A. BRENNAN.

Morriss, W. H.: The Prophylaxis of Anæsthesia Acidosis. *J. Am. M. Ass.*, 1917, lxviii, 1391.

The capacity of the plasma for combining with carbon dioxide is decreased after ether and chloroform anæsthesia; in other words, one influence of the anæsthetic is toward depletion of the alkali reserve.

During the first half hour of anæsthesia, this factor of safety is notably modified, and the drop is more profound in the case of chloroform than of ether.

The initial drop in the alkali reserve is followed by a rebound; from that level there is a gradual decrease until the conclusion of anæsthesia.

Preliminary administration of sodium bicarbonate increases the alkali reserve, though the most noteworthy effect of this treatment is to lead to higher values for this factor of safety at the conclusion of the anæsthetic.

The administration of this drug before operation is a rational precautionary measure against postoperative vomiting.

EDWARD L. CORNELL.

Jacobson, J. H.: Local Analgesia in the Cure of Abdominal Hernia. *Interst. M. J.*, 1917, xxiv, 273.

As a result of 215 operations performed by the author on 187 patients, he concludes that all forms of hernia can be safely and painlessly operated upon under local anæsthesia. He thinks that the method should become the procedure of choice for such operations. The general mortality from hernia in the

United States is as great as from any one of the infectious diseases. This mortality can be lessened only by more frequent radical operations, and since the use of local analgesia is the best means of lowering the mortality of hernia operations, it should be more generally adopted. The author includes a number of appendectomies in his list, but does not advise this as a routine procedure. He suggests that many of the failures in technique by those not familiar with the use of local anæsthetics are due to the fact that they do not wait the full fifteen minutes necessary to obtain complete analgesia. Novocaine has become the standard for local work on account of its lack of toxicity and its efficiency.

GATEWOOD.

Suga, M.: Recommendation of Spinal Anæsthesia for Laparotomy. *Sei-i-Kwai M. J.*, Tokyo, 1917, xxxvi, 15.

In a case of internal cancer the author was able to perform a complete hysterectomy without pain by spinal anæsthesia alone. He has since operated upon 100 cases by this method.

For laparotomy he recommends spinal anæsthesia for the following reasons:

1. Because operations can be done under completely painless conditions and in the shortest time.
2. Avoidance of the pre- and postoperative complications of general anæsthesia.
3. Removal of restless feeling of patient during early and late stages of general anæsthesia.
4. There is only a very slight postoperative effect.

W. A. BRENNAN.

SURGICAL INSTRUMENTS AND APPARATUS

Porter, J. B.: Sphagnum Surgical Dressings. *Internat. J. Surg.*, 1917, xxx, 129.

Sphagnum is the botanical name of the great group of mosses which form the basic vegetation of peat bogs; there are a great many varieties, but all have the common characteristic of being small, rootless, perennial plants with thread-like stems surmounted with a crown of short cell-like leaves. The plants grow slowly in large spongy masses. Only certain varieties are suitable for surgical dressings.

Sphagnum as a dressing has peculiar qualities of its own, which render it far superior to cotton for certain types of infected wounds. Its absorptive power depends largely upon the hollow, cell-like structure of the leaves. It is very useful as an absorbent for wounds and is also suitable for bed-pads, dysentery pads, pillows, splint pads, etc. For the latter the poorer grades of moss can be used. The fine soft surgical moss should be enclosed in muslin bags of light weight but close weave to prevent the fine particles from escaping and irritating the wound. The dressings are made up in different sizes and sterilized in the autoclave shortly before being used, or dipped in a solution of corrosive sublimate of sufficient strength to retain one-fourth of one per cent when dry. These dressings are made up in

bundles and shipped for emergency field work. It is important that all dressings should be first moistened in sterilized water or weak antiseptic solutions and squeezed out before they are applied.

The process of collecting, cleaning, and preparing sphagnum for surgical use entails considerable skill and labor and is carried on by voluntary organizations under the general control of Sir Edward Ward, Director General of Voluntary Organizations in England. So far the work of the organization has been done exclusively in Scotland and Ireland. The moss is also used in Germany. The plant grows freely in Canada and the northern part of the United States, but no reports are as yet available of the work accomplished there.

Moss dressings can be produced commercially at considerably less than one-half the cost of gauze and cotton, and on account of its usefulness sphagnum will undoubtedly be considered a valuable dressing after the war. L. R. GOLDSMITH.

Hodges, G. M.: Combined Suspension and Extension Apparatus for Compound Fractures About the Hip. *Brit. M. J.*, 1917, i, 423.

The instrument was devised for severe wounds of the buttocks and wounds of the upper third of the thigh with high fracture of the femur.

Patients with buttock wounds prefer to lie on the face, but when sepsis is established dependent drainage necessitates the patient lying on the back. This pressure on the wound is painful and frequently retards healing and makes dressing of the wound difficult.

Various forms of apparatus have been used but none has heretofore been found which was efficient

as a splint and comfortable to the patient, allowing access to the wound and facilitating nursing, simple of structure and application, easy of transportation, cheap, light and portable when packed; which requirements, it is claimed, are met by this new Hodges-Lockwood combined suspension and extension apparatus.

In position the splint is comfortable, provides extension and suspension with fixation, furnishes easy access to wound for dressing and permits the patient to be moved from place to place.

Packed the splint measures 36x36x9 inches. It consists of an iron cradle passed around the patient at the level of the umbilicus at right angles. To this cradle is attached a second cradle which passes vertically between the patient's thighs. To this again is fixed a crossbar to give support when the apparatus is on a stretcher, and a modified form of Thomas leg splint supported at the foot end by a folding upright. This leg splint is attached to the transverse cradle on the outer side by a short bar, adjustable as to length, and to the second cradle by a slotted bracket and a thumbscrew. A stout canvas sling is attached to the transverse cradle by straps and buckles, and suspends the patient's lumbar region. A second sling is attached to the second cradle and to the outer adjustable bar to take the weight of the thigh just below the natal fold. A third sling is fixed to the leg splint near the foot. The head, shoulders, and opposite leg being supported, the patient can be raised by means of the slings six inches above the bed.

Fixation is obtained in the same way as with a Thomas splint. By the adjustment of the short outer bar any required abduction can be obtained.

SURGERY OF THE HEAD AND NECK

HEAD

Boeckel, J.: Cranial Wounds (Les blessures du crâne). *Lyon chir.*, 1916, xiii, 903.

Since 1873 Boeckel has been an advocate of preventive trepanation in the case of cranial fractures. At that time he showed that every crushed cranial fracture almost invariably ended fatally; preventive trepanation, in peace time at least, permitted the saving of many lives. His personal statistics after the introduction of antiseptic surgery showed 25 crushed fractures treated by preventive trepanation without a single death.

Boeckel now examines to determine whether the facts disclosed in the present war confirm his prior results. He had operated upon 61 cases of cranial vault fractures. There were 10 deaths and 51 recoveries, a mortality of 16.4 per cent. Preventive trepanation which prior to the antiseptic period had a 33.3 per cent mortality has now fallen to 16.4 per cent.

Boeckel thinks that in a cranial fracture case the course followed should be the same as that in comminutive fractures of the limbs. Even in cases which are apparently simple, where there is found only a slight fissure of the external table, intervention should be active. Exploratory trepanation, which has been used for 40 years, finds an indication in all doubtful cases. Such an intervention does not aggravate the prognosis. If it is negative the wound heals rapidly. In cases where it exposes lesions it becomes curative. Of course there is a limit. If non-penetration is assured and the vitreous table does not show crushing simple exploration suffices. But even such cases must be watched with care. In his 61 cases the author made 8 exploratory trepanations. Two were negative. All recovered.

Boeckel thinks that early evacuation of such patients is often responsible for the early secondary accidents, such as cerebral abscess and meningitis. These can be attributed to the effects of transporta-

tion. In 25 trepanations in civil life he observed secondary accidents only once. Since the war he has had 6 cases in which a secondary trepanation was necessary, 2 of which ended fatally.

As regards late accidents of cranial injuries, Boeckel thinks that sufficient time has not elapsed to express a judgment based on the experiences in the war.

Boeckel gives his opinion that it is absolutely necessary to practice preventive trepanation in all fractures of the cranial vault, with the reserve formulated by him. He also counsels exploratory trepanation in doubtful cases where the nature and intensity of the traumatism does not give evidence of the existence of a fracture. Deplorable accidents, even death, is often the result of abstention which is not justified.

W. A. BRENNAN.

Castex, M. R., and Pradere, R.: The Diagnostic Value of Cranial Puncture According to the Technique of Pollak-Neisser (Le valor diagnostico de la puncion craneana segun el procedimiento de Pollak-Neisser). *Prensa méd. argent.*, 1917, iii, 308.

The authors call attention to the diagnostic and therapeutic value of cranial puncture according to the procedure of Pollak-Neisser. They use the Pollak-Neisser perforator which is attached to an electromotor which gives a velocity of from 1,800 to 3,000 revolutions per minute. The skin is aseptized as for a craniotomy and all instruments sterilized. The puncture is only slightly painful and a general anæsthetic is necessary only when immobility is difficult by other means. Generally a local anæsthetic — ethyl-chloride — is used and in susceptible patients a morphine injection is given an hour before. The technique of the puncture is described in detail and illustrated. As a general rule punctures can be made at any point where there are no large endocranial vessels, but on this account the cranial base region must be avoided. By means of punctures the authors have been able to extract cylinders of nerve substance from the majority of the cerebral lobes and both cerebral hemispheres. In endocranial hæmorrhages of traumatic origin the exact point of location of the extravasation can be determined and sometimes total or partial extraction of hæmatoma can be effected. The analysis of fluid extracted gives an approximation of the time of the hæmorrhage, whether recent or old. The procedure provides interesting data in cerebral apoplexy.

The authors have observed cases of hæmorrhagic pachymeningitis in which puncture ratified the diagnosis and permitted extraction of a quantity of fluid which produced amelioration in the subjective and objective symptoms. Similarly in cases of cerebellar serous cysts.

The diagnostic importance reaches its maximum in brain tumors. The authors found many cases of cerebral tumor clinically diagnosed and localized in which puncture ratified the clinical and topo-

graphic diagnosis and indicated the nature and type of the tumor, small celled sarcomata, spindle-celled sarcomata, gliomata, etc.

Contra-indications do not exist as a general rule. Dangerous hæmorrhage and infections can be avoided. Logically lumbar puncture is preferable to cranial; however, the latter has advantages in processes that are really cranial, avoiding the danger of death in bulbar compressions by tumors of the posterior cranial fossa and especially of the cerebellum.

The authors have not observed headache, vomiting, malaise, nor lipothymia, which have been observed in some lumbar punctures.

The procedure is indicated as a therapeutic measure in cases of endocranial hypertension in which lumbar puncture gives no result. It is an excellent palliative in the whole group of tumors and pseudotumors. Not only is it palliative, but in cases of serous cysts, hæmorrhages, abscesses, etc., it has been curative.

W. A. BRENNAN.

Speed, K.: Gunshot Fractures of the Skull: Statistical and Critical Review Based on a Series of Seventy-five Cases. *J. Am. M. Ass.*, 1917, lxviii, 1299.

The author summarizes his work on several hundred gunshot skull fractures seen in a base hospital 40 miles back of the Somme front, with the following conclusions:

A large percentage of gunshot skull fractures reaching the base hospital will recover with no other treatment than thorough rest and dressing of the wound. Wounds of the cranium not involving the brain recover readily. Wounds in the frontal region seem to offer the best prognosis, although because of the many varying factors, depth of penetration, size of metal, etc., it is impossible to compare the different skull areas with any degree of accuracy. A large majority of deaths result from septic infections, which however may spread very slowly. Recovery from serious symptoms with foreign bodies within the brain is possible without operation. It is unwise to attempt the removal of deep lying foreign bodies, especially those located near some vital center of the brain. Hernia cerebri, while not necessarily fatal, is unfortunately a frequent sequel and one which should be guarded against wherever possible, by not incising a dura which has not already been opened by the fracture. Hernia predisposes to late meningitis. Cases with gas infection of the brain have recovered. Operation is indicated to clear wound edges and to remove loose and floating bone fragments, to decompress, preferably in a clean area, when increased intracranial tension from progressive cerebral or dural hæmorrhage threatens life, and to remove superficially lying foreign bodies. Eye-ground examinations are of little help in establishing early indications for operation. Bone and dura adherent over sinuses should be left in place. Steel helmets offer a large measure of protection.

R. B. BETTMAN.

Bonnus, G., Chartier, M., and Rose, F.: Radiotherapeutic Treatment of the Meningo-encephalic Sequelæ of Cranial Traumatism (Le traitement radiothérapique des reliquats méningo-encéphaliques des traumatismes crâniens). *Bull. Acad. de méd.*, Par., 1917, lxxvii, 418.

The favorable results obtained by the authors from radiotherapy in treatment of traumatic lesions of the central and peripheral nervous system have led them to apply this method in traumatic lesions of the cord and its covering. There has been considerable amelioration, particularly in cases of medullary and radicular compression consecutive to hæmorrhages.

The treatment was applied in three classes of cases:

1. In localized or reflex phenomena by duramater irritation.
2. In motor or sensory Jacksonian epilepsy and in reflex epilepsy.
3. In some cases of spastic paralyses due to superficial cerebral lesions.

All the cases treated had been trepanned. The authors think that the favorable results obtained should not be a matter for surprise since the action of the X-rays on the different cicatricial processes is well known. In meningeal lesions this treatment should free adhesions if they are neither too dense nor too old. In encephalic lesions the rays should act on the cicatricial sequelæ resulting from small hæmorrhagic lesions.

Where there is extensive destruction of nerve elements radiotherapy is without effect.

W. A. BRENNAN.

Drew, H. V.: The Application of Surgical Methods to the Treatment of Cerebrospinal Meningitis. *Brit. M. J.*, 1917, i, 223.

As all agree that tapping in cerebrospinal meningitis is essential, and as it has to be repeated a number of times, each time with temporary benefit, Drew suggests that a large amount of suffering and trouble might be avoided by using continuous aseptic drainage. The cannula would need to be especially strong and would be protected by a shield, and the flow could be regulated to suit the case. He suggests the application of continuous drainage for "simple" cases.

There remain those cases in which the flow is at first enough in quantity and then becomes insufficient, while the symptoms become aggravated, or those in which the flow is from the first purulent and too inspissated to flow at all — those cases, in fact, to which the treatment of tapping, let alone injection of antitoxin, is impossible. They are the unfavorable ones and practically supply most of the deaths. It is these cases to which the author thinks surgery could be applied with advantage — where, in fact, partial laminectomy might be done, for the purpose of direct drainage and perhaps lavage with saline, in order to establish a flow of spinal fluid which has been interrupted by adhesions.

P. G. SKILLERN, JR.

Carniol, A.: Intrarachidean Injection of Insoluble Substances (L'injection intrarachidienne de substances insolubles). *Presse méd.*, 1917, p. 91.

Intraspinal injections have had better results in anæsthesia than in the treatment of nervous diseases. The author thinks that one of the most important causes of this is that in such injections the substances injected are absorbed at the point of injection, and do not reach the brain. The author has considered that injection of insoluble substances would obviate such absorption and in some preliminary experiments on dogs found that massive injections of different substances were well borne. The experimental work was afterward tried on some hospital patients but the war has interfered with the pursuit of the investigation.

Carniol has injected epileptics with amounts of carbonate of calcium varying from 30 to 70 centigrams suspended in a cubic centimeter of distilled water or olive oil. The substance being almost insoluble does not become hypertonic whatever the concentration may be. The results obtained are: cephalgia which is sometimes intense, a slight rachialgia at the injection point, slight fever for a few days, but no disturbances of motility. Some patients have no subjective troubles. Therapeutically the most important result is that patients who daily had from two to five attacks have had only one attack in from five to eight days. After this the attacks recommence but are not so frequent.

Injection of 50 cg. of calcium carbonate in four chronic maniacs gave no satisfactory results.

In syphilis of the central nervous system the author tried salicylate of mercury in aqueous suspension. The reaction was negligible.

W. A. BRENNAN.

Sharpe, W.: The Operative Treatment of Hydrocephalus; a Preliminary Report on Forty-one Patients. *Am. J. M. Sc.*, 1917, cliii, 563.

The author attempts to drain the ventricles, in the internal hydrocephalus, and the subarachnoid space, in the external type, into the subcutaneous tissues of the scalp by means of linen strands. Drainage tubes will always be blocked by adhesions, while the linen strands will not be absorbed within four months and in this time he hopes that a permanent channel will be established by the ingrowth of endothelium along the course of the threads. In a series of 41 cases, 13 died, all within 36 hours after operation, due probably to shock following the rapid loss of cerebrospinal fluid. Of the 28 living, all but 6 have shown more or less improvement, although sufficient time has not yet elapsed to permit an opinion regarding the permanency of the improvement. If the patient is lying in a horizontal position and the midline of the head is on a level with the spinal column, a ventricular and a lumbar puncture will reveal a like pressure if the

case is one of hydrocephalus externa, but in a case of hydrocephalus internus, the ventricular puncture will show a fluid under greater pressure.

R. B. BETTMAN.

NECK

Lahey, F. H.: Intrathoracic Goiter. *Boston M. & S. J.*, 1917, clxxvi, 341.

Lahey states that in his opinion there is no disease of the thyroid so often overlooked by physicians or surgeons unfamiliar with thyroid diseases as substernal or intrathoracic goiter. He believes that these growths are either adenomata or cysts, originating in the right or left lower pole or isthmus of the thyroid and gradually enlarging downward into the thorax along the path of least resistance. These two factors, he considers, enter into the production of the intrathoracic growth of goiter: first, the fact that downward and into the chest is the path of least resistance for these growths originating at the lower poles of the gland, and second, the upward and downward motion of the thyroid gland in deglutition.

The symptoms produced by these goiters the author mentions as a dull feeling of pressure beneath the sternum on swallowing; the uncomfortable feeling of the mass ascending and descending as it does on swallowing; huskiness of the voice; dyspnoea of greater or less degree, depending upon the size and situation of the tumor and intermittent attacks of suffocation.

He also believes that one should suspect intrathoracic goiter in some cases of asthma, and the condition being suspected, he believes the diagnosis may be made by the demonstration of abnormal dullness over the upper part of the chest, by the demonstration of the tumor mass within the chest by the X-ray, and by the inability to demonstrate the inferior pole of either side with the palpating finger.

The operative treatment, the author states, resolves itself merely into the mechanical problem of elevating the buried mass out of the chest upon the neck. These goiters must be delivered in toto and never by morcellation or piecemeal, as the latter method results first in severe oozing, he claims, which can be controlled only by ligation of the main blood supply to the tumor, and secondly, in leaving well-nourished segments of the tumor behind, from which further intrathoracic growth may occur.

The author found that the form of anæsthesia practiced by him in all goiter operations as far as possible — that is, morphia, scopolamine, and novocaine — was the ideal anæsthesia. With ether, breathing may be difficult and oozing certainly more profuse.

Intratracheal anæsthesia was necessary in the case in which the sternum was split, as chiseling of bone does not fall within the domain of local anæsthesia, and further because the laryngologists

reported marked narrowing of the trachea, suggesting the possibility of collapse of that structure from the intrathoracic manipulations.

GEORGE E. BEILBY.

Clark, P. S.: Consideration of the Surgical Treatment of Exophthalmic Goiter. *Clinique*, Chicago 1917, xxxviii, 227.

The activity of the thyroid is increased by infection, as recurrent tonsillitis, intestinal toxæmia, and waters from certain areas, which are rendered non-infective by boiling.

The reasons for the general aversion of physicians to operative treatment of exophthalmic goiter are three:

They have been thought extremely bad operative risks. However, a 25 per cent mortality on earlier cases operated late in the disease after extensive heart, kidney, and nervous changes, has dropped to a 3 per cent mortality in 5,000 later operations.

Non-operative procedures have shown some benefit, though these have often only deferred operation and rendered it dangerous.

The disease may be either persistently or intermittently advancing. In the later class spontaneous cessation or even improvement is attributed to non-operative measures.

Contra-indications to thyroidectomy are: cardiac dilatation over an inch, a rapid or irregular heart, gastric crises, diarrhoea, severe nephritis, ascites, and oedema of hands or feet, acute delirium, incipient myxœdema, and status thymicolymphaticus.

The operations commonly used are:

1. Injections into the gland.

2. Ligation of the vessels.

3. Partial removal of one or both lobes with all or part of the isthmus.

Injections now are of one to three drams of boiling water directly into the most prominent lobe. They result in diminished pulse-rate and lessened toxæmia and hence are of great value preparatory to operation.

Ligation of vessels is used, first, in mild cases to re-establish the gland's normal function; second, in severe cases as preparation for the more severe thyroidectomy; third, to supplement the removal of one lobe of the gland with the ligation of the superior vessels of the other lobe. The technique of choice is mass ligation of the superior thyroid vessels, including veins, arteries, nerves, and lymphatics, the superior vessels being chosen to avoid recurrent nerves and parathyroids. This may be done under local anæsthesia. In mild cases both superior vessels are ligated at one operation. In severe cases but one is ligated; if the reaction is marked, the second is ligated a week later and resection postponed for four months; if the reaction is mild, resection is performed a week after the first ligation.

Partial thyroidectomy, the most effective present-day treatment, requires nicety of judgment. Ligation of the superior arteries may render further operation unnecessary. Ordinarily the more vas-

cular lobe with the isthmus is removed and if relapse occurs there may be further removal up to one-half of the remaining lobe. With a large and vascular thyroid and a good operative risk only one-half of one lobe is left at the first operation or one entire lobe is left and its artery ligated. In poor risks operation should be preceded by the injection of boiling water into the gland or ligation of one or more arteries.

The great lowering of mortality in thyroidectomy is held to be due less to technical details than to better judgment in preparation of the patient and

the time, type, and extent of operation and its division into stages.

As to the postoperative results a report of a large series from American, French, and German clinics shows a reduction in the mortality from 25 per cent to 4 per cent and even lower; they report 75 per cent and 86 per cent cured sufficiently to resume their former occupations. Comparative figures for non-operative measures are: mortality of 10 per cent, 25 per cent, and 35 per cent, and 20 per cent to 25 per cent cured sufficiently to return to work.

JESSE D. COOK.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Simon, S.: Artificial Pneumothorax in Pulmonary Tuberculosis. *N. Y. M. J.*, 1917, cv, 734.

Dr. John B. Murphy in 1898 first brought to the notice of the general medical profession, the method of treating pulmonary tuberculosis by collapsing the lung by means of artificial pneumothorax. James Carson nearly a century ago employed the method experimentally in rabbits, while Potain was probably the first to use nitrogen gas. A large percentage of cases in which compression is properly obtained, show arrest or marked improvement of the disease, and the most harassing symptoms are often allayed even with incomplete collapse. The beneficial results are mainly due to mechanical rest of the diseased lung combined probably with some vascular change, whether anæmia or hyperæmia is not certain, which accelerates fibrous tissue formation. Patients who fail to improve under other treatment, even with bilateral lesions, as well as those with severe hæmorrhage or constant bleeding from a source which can be located, should be given the benefit of this treatment. With reasonable care there is very little danger in carrying out the Forlanini technique. Oscillations in the manometer, synchronous with breathing, will give definite information as to whether or not the needle is in the pleural space. The best method of producing compression of the lung is to give the gas in small quantities and at three to five-day intervals. The treatment will always be limited, due to the small number of suitable cases.

R. B. BETTMAN.

Muggia, A.: Pleural Eclampsia in Artificial Therapeutic Pneumothorax (Della eclampsia pleurica nel pneumotorace artificiale terapeutico). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 332.

The possibility of nervous complications occurring after interventions in the pleura is clinically known, and the importance of such accidents has increased since the introduction of artificial pneumothorax in the treatment of pulmonary tuberculosis.

The symptom-complex of the entity known as

pleural eclampsia is distinguished by three types: (1) accidents of convulsive or epileptic type; (2) accidents of hemiplegia; (3) syncopal accidents always terminating in death. Such phenomena are infrequent and very rarely fatal.

Regarding etiology, pleural eclampsia has been confused with gaseous embolism. Forlanini explains the nervous manifestations either as the effect of spasm of the cerebral vessels, or as reflex action on the heart, provoked by pleural irritation. In Germany the possibility of reflex manifestations has been denied.

In 30 primary inductions of artificial pneumothorax and about 1,000 recurrences the author has on four occasions noticed eclamptic convulsions. Three times they were in the same individual. The author concludes from this that there can be no question of gaseous embolism; but that the morbid entity known under the name of pleural eclampsia is of undoubtedly reflex origin. W. A. BRENNAN.

DePage and Tuffier: Sterilization and Closure of Pleural Suppurations After Pleurotomy (Stérilization et fermeture des suppurations pleurales après pleurotomie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 790.

The current method of treating pleural suppurations after pleurotomy, consists in draining them, after pleural lavage, and waiting with the expectation that the lung may come in contact with the wall or the wall come into contact with the lung. When neither occurs, recourse is had to a long and tedious period of successive costal resections and similar procedures.

The authors believe that this can be improved. Their method of treatment is carried out in two stages: (1) after pleurotomy, the pleura is sterilized; (2) the operative wound is closed. In this technique Carrel's method of progressive and methodical sterilization with Dakin's fluid is applied. The secretions are methodically examined and when the microbial count indicates clinical sterilization, this is considered an indication to close the operative wound and to transform the old suppurating cavity into a closed pneumothorax. This is spontaneously

absorbed and the lung and thoracic wall are brought into contact. After sterilization is effected and maintained for five or six days the operative wound is closed under local anæsthesia with stovaine. In some cases excision of the edges of the cicatrix may be necessary.

The authors have treated 12 cases of open empyema by this method, 10 traumatic and 2 spontaneous cases. Two of these patients had a thoracotomy on the date of injury. In the other 10 cases intervention was made between 9 and 77 days after the lesion started.

For the 12 cases the time elapsed between injury or commencement of the lesion and closure has varied from 12 days to a year. Ten cases have been sutured with complete reunion. In one case adhesive strips were used to close the wound.

The authors conclude that an open purulent pleurisy can be sterilized by the Carrel method. When it is sterile the wound can be closed without troubling about the cavity beneath.

W. A. BRENNAN.

Guidi, G.: Two Cases of Primary Tumor of the Anterior Mediastinum (Su due casi di tumore primitivo del mediastino anteriore). *Rev. di clin. pediat.*, Firenze, 1917, xv, 113.

Guidi gives the complete clinical histories of two cases of primary tumor of the anterior mediastinum in boys aged 7 and 5 years respectively, and which he was able to follow in their complete evolution. Both patients died. Necropsy established the diagnosis in the first case of a primary tumor of the thymus with renal pancreatic and glandular metastases, and in the second case a neoplasm of the anterior mediastinum with metastases in the kidneys and abdominal and thoracic glands.

In the first days in which these cases were observed in the clinic a diagnosis of mediastinal tumor was not possible. The symptoms led the author to think of an adenopathy of tubercular nature. In tracheobronchial adenopathies, especially when the peritracheobronchial and intertracheobronchial glands are involved and notably enlarged, they form a dense voluminous mass which comes into contact with the thoracic walls either in front or behind and forms a zone of denseness which anteriorly occupies the sternal manubrium, the internal part of the first intercostal spaces, and the sternoclavicular articulations, and posteriorly occupies the paravertebral regions. Such conditions were present in both cases; there was also the dry, painful insistent cough which usually accompanies tubercular adenopathy.

But the progressive and rapid increase in volume of the mediastinal mass and its persistent situation in the anterior mediastinum, the notable increase in the cervical and axillary glands, and the prominence of the sternum and anterior parts of the thorax excluded all other hypotheses and formulated the diagnosis of primary mediastinal tumor. The anatomopathologic examination showed that in both cases the tumors originated in the anterior

part of the mediastinum. In the first case the neoplastic mass was uniform, soft, and pale; in the second case the mass was irregularly lobulated, hard, and elastic; yellow in color, and with small disseminated nodules. Histologically they were sarcoma, or more precisely lymphosarcoma with extensive metastases invading all the neighboring organs. In the first case the finding of residual thymic tissue with the corpuscular characteristics of Hassall making part of the tumor itself leaves no doubt that this was a case of lymphosarcoma of thymic origin. In the second case there was no trace of thymic tissue, and the hard consistency of the tumor as well as the lobulated form rather suggests that its point of origin was in some ganglion of the anterior mediastinum.

The only surgical treatment in these cases was exploratory thoracentesis. Attention is called to the inefficacy of all treatments tried in malignant neoplasms of this kind.

W. A. BRENNAN.

TRACHEA AND LUNGS

Lilienthal, H.: The Relation of Radiography to the Diagnosis and Therapy of Non-tuberculous Diseases of the Lungs and Pleura. *Med. Rec.*, 1917, 91, 587.

As a surgeon the author believes that roentgenology of the chest is the cornerstone of modern endothoracic operative therapy. It not only localizes the lesion but determines its nature. Its findings should be correlated with the clinical history and physical signs and often checked up by bronchoscopy. In purulent pleuritis it is of particular value, inasmuch as it indicates the site for operation and frequently gives valuable information as to the kind of operation required. By showing the presence of metastases in the lungs it may prevent useless operation for malignancies elsewhere. In the radical surgery of non-tuberculous pulmonary suppuration the aid furnished by the roentgen ray is of great value.

ADOLPH HARTUNG.

Mariotte, G.: Intervention for Primary Echinococcus Cyst of the Lung (Intervento per echinococco primitivo del polmone). *Policlin.*, Roma, 1917, xxiv, sez. chir., 129.

Echinococcal lesions of the lung form from 7 to 16 per cent of the total organic lesions of this kind in man according to the statistics of different authors.

From the operative point of view if the cyst is very large the thoracic wall becomes deformed from the internal pressure of the cyst. In such case the cyst is easily exteriorized on incising the wall and there is little danger of pneumothorax. But in the case of smaller cysts collapse of the lung is to be feared as well as pneumothorax although there is now diversity of opinion as to the danger arising from the latter.

The author briefly refers to the various surgical procedures practiced. In a case reported by him he

operated in two stages. In the first stage he resected parts of the seventh, eighth, and ninth ribs, and by a very free resection of all the intercostal soft parts he obtained a vast zone of pleural tissue about 7 cm. in diameter. Having found that there was perfect mobility of the pulmonary edge, owing to the absolute absence of pleural adhesions, the author sutured all around this edge including the two pleural coats between the sutures so as to isolate an operative field in the midst of which he could freely enter the pulmonary parenchyma and reach the cyst. The whole large breach was then tamponed with dry sterile gauze, kept in place by temporarily suturing the skin over it. During the maneuvers some air entered the pleural cavity and the patient had a slight pneumothorax which was resorbed within 48 hours. On the thirteenth day the author proceeded to the incision of the pulmonary parenchyma and the lung. The cyst immediately protruded and ruptured and about 100 gr. of limpid fluid issued. This may have been due either to the cystic membrane being very fragile or to pulmonary adhesions.

The cyst was plugged and the cavity drained. Some days later the whole of the membrane was curetted from the cavity existing in the lung. Recovery thence was rapid.

Mariotte maintains that in echinococcic cyst of the lung operation in two stages associating fixation by suture and tamponade gives the best and most secure results.

Pneumothorax is avoided which is not an indifferent advantage inasmuch as it is not yet fully demonstrated that this is constantly harmless. Moreover, in a non-septic focus which has not a malignant course such as in cancer or sarcoma, he thinks that it is preferable to await the formation of adhesions which gives the surgeon security in the route of

approach, and frees the patient from the risk of danger which is always present in pneumothorax.

W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Dujarrier, C., Chauvel, I., and Loiseleur, J.: Bullet Wound of the Heart (Plaie du cœur par balle). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 678.

Four cases have been published since the beginning of the war of projectiles removed from the heart. These gave two recoveries and two deaths.

Two more cases are now reported by Dujarrier and Chauvel and Loiseleur. In Dujarrier's case the heart was exposed after resection of the terminal portion of the sternum, the sixth, seventh, and eighth left costal cartilages, the sixth and seventh right, and vertical incision of the pericardium. The bullet was found in the anterior wall of the right ventricle. The cardiac wall was compressed between the index and middle fingers of the left hand, the ventricle incised, the bullet removed, and the wall sutured with No. 1 catgut. The operative wounds were closed and drains placed. The heart never stopped beating.

In Chauvel and Loiseleur's case an 8 cm. incision was made along the left sternal border following the sixth intercostal space. The intercostal muscles were incised and cartilages stripped. After incising the pericardium the index finger felt the projectile in the myocardium parallel to the edge of the heart and near the apex. The apex of the heart was seized by a Kocher forceps and drawn into the wound, the myocardium incised, and the bullet extracted without hæmorrhage. The myocardium was closed with a couple of sutures of No. 0 catgut. The wound was closed and drainage inserted. Both patients recovered.

W. A. BRENNAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Rixford, E.: Acute Suppurative Cellulitis of the Stomach. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The affection has long been known to pathologists. Its relation to diseases now known to be due to streptococci was recognized as early as 1837 (Ditt-rich). It was well described by Brinton in 1859. The affection is rare — only about 150 cases being found in all in the literature, but is almost invariably fatal, a few cases of localized abscess recovering after drainage, only one of the diffuse form, that of Koenig, recovered following prompt total gastrectomy. Clinically the affection begins suddenly with burning pain in the epigastrium, not relieved by drinking or taking food, persistent vomiting, epigastric tenderness, rigidity, leucocytosis 10,000 to 20,000 with high percentage of polymorphonuclears, considerable fever, rapid pulse, early prostration

going on rapidly to cyanosis, delirium, death in coma in two to ten days. The mucous membrane may slough and be vomited. The lesion is a streptococcal cellulitis of the submucous areolar tissue of the stomach sharply limited by the pylorus and cardia, strings of leucocytes extending out into the muscle.

The cases are generally divided into two groups: primary — idiopathic, and secondary, where the portal of entry is evident. For purposes of diagnosis and treatment cases may be divided into three groups: (1) localized abscess, the most favorable, (2) multiple small abscesses in the indurated wall of the ulcer or carcinoma, (3) diffuse cellulitis, least favorable.

In the first group drainage is indicated, in the second large partial gastrectomy, in the third total gastrectomy or nothing surgical unless intragastric drainage be possible. Medical treatment is merely

palliative: absolute rest, nothing by stomach, ice-bag to the epigastrium, fluids by rectum or intravenously, stimulants and opiates as indicated.

The following cases came under the author's personal observation:

1. Large thin walled carcinomatous ulcer surrounded by multiple miliary abscesses, died of secondary hæmorrhage (slough of suture line) on eighteenth day after extensive gastrectomy by Billroth No. 1.

2. Acute hæmorrhagic ulcer of the anterior wall of the stomach with diffuse cellulitis—extensive gastrectomy with gastro-enterostomy, death four hours later, pure culture of streptococci.

3. Diffuse cellulitis of entire stomach, sharply limited by pylorus and cardia, incision, drainage, pure culture of streptococci, death twenty-four hours after operation on the third day from the beginning of the attack.

4. Pyloric obstruction, multiple papillomata of the stomach, gastro-enterostomy preliminary to proposed excision, death a few hours after the gastro-enterostomy.

Skilern, P. G., Jr.: Stab Wound of the Deep Epigastric Artery. *Ann. Surg.*, Phila., 1917, lxx, 450.

The author relates the case of a young girl who was accidentally stabbed in the abdomen with a pen-knife. Cœliotomy revealed division of the deep epigastric artery and blood-clots in the pelvis. The gut was perforated, but not enough to allow escape of gas. Both ends of the artery were ligated, the clots were removed from the pelvis and the patient recovered.

The few instances cited in the literature teach emphatically that wounds of the parietal arteries, namely, the epigastric, the circumflex, the mammary, and the lumbar arteries, are not to be regarded as trivial, but demand the rigorous application of the rules for the management of wounded arteries, exposure of the bleeding point, and a proximal and a distal ligature. In this case it was just as important to find out what the knife did not do, as it was to find out what it did do.

Discussing the surgery of the deep epigastric artery Skilern states that it is involved in the following conditions:

1. Stab or gunshot wounds, already considered.
2. Spontaneous hæmatoma of the rectus muscle.
3. Injury in paracentesis abdominis.
4. Division during a cœliotomy incision. Here the conditions are the same as when the artery is divided by a stab wound, and they must be dealt with accordingly, making sure to ligate both ends.
5. Postoperative secondary hæmorrhage, especially in drainage cases. Here it is the custom to pack, but ligation of the vessel at its origin is both surer and safer, and prevents recurrence of secondary hæmorrhage with possibly fatal results.
6. Division of anomalous obturator artery when cutting Gimbernat's ligament to relieve the constrict-

tion of a strangulated femoral hernia. Since this accident cannot be foreseen when working from below, it may be avoided to some extent by dulling the blade of the herniotome, so that while it is sharp enough to divide the dense Gimbernat ligament, it is so dull that it pushes the artery before it. It should be borne in mind, also, that the merest nick of the constricting tissue is usually all that is necessary to overcome the strangulation. In case of uncontrollable hæmorrhage from the vessel it must be ligated close to its origin from the deep epigastric artery in the manner already described for the latter vessel.

DePage, A.: Penetrating Wounds of the Abdomen Treated at the Ambulance of LaPanne (Plaies pénétrantes de l'abdomen traitées à l'ambulance de l'océan, a La Panne. *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 691.

DePage gives his statistics of abdominal wounds from December, 1914, to March, 1917. In this period 186 laparotomies were done. These are divided into 3 categories: (1) cases operated upon from December, 1914, to May 1, 1916; (2) cases operated upon from May 1, 1916, to March 10, 1917; (3) cases operated upon in the advanced surgical posts established since June 1, 1916. The statistics show a lowered mortality in the second period.

In seeking the reasons for the improvement in the statistics the author points out that the operative indications and the operative technique have not been materially changed since the beginning. From May 1, 1916, the author has rigorously and systematically applied shock treatment to the abdominally wounded. This undoubtedly had a favorable effect on the laparotomies; but the essential cause of the betterment of the statistics is unquestionably to be traced to the early intervention. Up to May, 1916, the abdomen cases did not reach the ambulance till from six to fifteen hours after injury. Since the establishment of the advanced posts the wounded are received there in a time varying from twenty minutes to three hours.

The rapid evacuation of the wounded from the first aid stations and their transport without jolting marks the greatest advance in the treatment of penetrating abdominal wounds. W. A. BRENNAN.

Weiss: A Case of Diaphragmatic Hernia Due to Contusion (Un cas de hernie diaphragmatique par contusion). *Presse méd.*, 1917, p. 194.

Weiss reports a case of diaphragmatic hernia due to a thoracic contusion. The condition was suspected from the symptoms and an exploratory laparotomy done. A small orifice was discovered in the posterior face of the left diaphragm through which a part of the transverse colon herniated. The abdominal wound was temporarily closed and by a large resection of the seventh rib, the pleura was opened, disclosing a voluminous hernia partly gangrenous. The intestinal loop was so adherent to the

diaphragmatic orifice that it could not be extricated. The hernia was only three weeks old and was due to traumatic rupture of the diaphragm produced by contusion.

Weiss' experience shows that, except rarely, such herniæ are produced on the left side either by a wound or by a fall causing rupture. When suspected the lesions must be looked for as there are no clear diagnostic signs. Radioscopy is the best method. Diagnosis ought to be early to avoid adhesions and strangulation. The route of approach is transpleural and not by laparotomy.

W. A. BRENNAN.

Quarella, B.: Contribution to the Study of Primary Malignant Tumors of the Peritoneum (Contributo allo studio dei tumori maligni primitivi del peritoneo). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 257.

True primary tumors of the peritoneum constitute a somewhat rare anatomopathologic entity. The greater part of those reported are cases in which the tumor was derived from the endothelium of the lymphatics. The number of cases in which the tumor originated from the peritoneal wall are very few.

The author describes two cases which were observed in his practice. Both patients died and the tumors were examined at autopsy. The author discusses the various findings in other reported cases of similar tumors and from the macroscopic and histological findings in his own cases he feels justified in diagnosing the tumors as diffuse lymphangio-endothelioma since proliferation in the endothelium and direct passage from it into the neoplastic cells was demonstrated.

From the histological standpoint the general characteristics of this class of neoplasm are: The neoplastic cells generally show a form and structure clearly epithelial. While varying in their dimensions they frequently assume a cubical or cylindrical form. They customarily show to a somewhat limited degree necrotic and degenerative traits. In many cases the neoform connective tissue assumes a papillar structure.

It is very exceptional for true metastases to originate from such a tumor; they are more prone to become diffused under the form of nodules which are rarely pedunculated, more frequently sessile and only slightly elevated. They are carried by the lymph channels, and it is only in the very advanced stages that they assume a true infiltrative and destructive character.

W. A. BRENNAN.

Martin-Du Pan, C., and Martin, R.: Treatment of Diffuse Peritonitis by the Fowler-Murphy Method (Traitement de la peritonite diffuse par la methode Fowler-Murphy). *Rev. méd. de la Suisse Rom.*, 1917, xxxvii, 5.

The authors have operated upon 28 cases of diffuse appendicular peritonitis. The Fowler position and the Murphy-drop method were used in 16 of these cases, all of which recovered. In the

other 12 cases in which the Fowler-Murphy method was not used there were 7 deaths and 5 recoveries. The cases comprised all ages from 17 months to 60 years. In all there was purulent diffuse peritonitis and the majority of the cases were very serious. The author believes that several would have proved fatal had not the Fowler-Murphy method been employed.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Finney, J. M. T.: The Diagnosis and Choice of Operation in Certain Affections of the Stomach and Duodenum. *N. Y. St. J. Med.*, 1917, xvii, 203.

The great majority of cases presenting symptoms of disease of the stomach or intestines are capable of diagnosis. Finney pleads for a very thorough routine physical examination in such cases. Often a case suddenly loses all of its baffling uncertainty and vagueness the moment the finger is inserted into the rectum during a routine examination. Osler facetiously remarked one time that the chief difference between a consultant and a general practitioner often lay in the fact that the consultant usually made a rectal examination while the practitioner did not.

No group of cases calls for a closer co-operation of the skilled surgeon, internist, roentgenologist, and laboratory man than the gastro-intestinal group. When operation has been decided upon, the surgeon should choose the particular operation, not according to habit, but according to the needs of the individual case. Pyloroplasty, the greatest indication for which is in cases of pyloric stenosis due to a chronic ulcer at or near the pylorus, has certain advantages over gastro-enterostomy, among others being: ulcers can be seen and excised, the normal relationship of intestines and stomach is not disturbed, and in Finney's series the mortality was lower. The end-results in his series of cases showed 88.6 per cent cures where pyloroplasty was done, as against 77.2 per cent in gastro-enterostomy cases.

R. B. BETTMAN.

Burnham, M. P.: Roentgen Diagnosis of Gastro-colic and Duodenocolic Fistulæ. *Am. J. Roentgenol.*, 1917, iv, 173.

After calling attention to the extreme rarity of the condition as evidenced by the small number of cases reported, the author reports in detail two cases which he claims are the first reported in which a fistula has been demonstrated by the roentgen ray resulting from a primary lesion in the colon. Both of these cases were unrecognized clinically. In one of them there was a primary carcinoma in the proximal part of the splenic flexure which had perforated and formed several fistulous tracts communicating with the stomach. The above findings, obtained by autopsy, coincided completely with the roentgenologic diagnosis previously made.

The second case showed a communicating fistula between the distal leg of the hepatic flexure and the duodenum just below the bulb. Here also the primary lesion was a carcinoma of the colon. The roentgen diagnosis was confirmed by operation and the patient made a good recovery. In both of these cases the opaque meal and enema were used and the findings of one method substantiated by the other.

ADOLPH HARTUNG.

Finochietto, R.: Gastric and Duodenal Ulcers (Sobre ulceras del estomago y del duodeno). *Rev. Asoc. méd. argent.*, 1917, xxvi, 210.

In the author's hospital practice out of 1,600 patients, 83 cases of gastric and duodenal ulcer were observed, 55 of which were operated upon. Gastric ulcers were observed more frequently than duodenal. Chronic perforation was present in 7 gastric and in 6 duodenal ulcers. There were 3 cases of subacute perforation.

Discussing the symptomatology the author thinks that in case of doubt between an acute appendicitis and a perforated ulcer, the incision should always be epigastric.

Of the gastric perforated ulcers 4 were into the liver, 2 into the pancreas, and 1 into the transverse mesocolon. Of the 6 duodenal perforated ulcers 3 perforated into the liver, 1 into the liver and pancreas, and 2 into the pancreas alone.

Gastro-enterostomy is the operation of choice and this should rarely be accompanied by exclusion of the pyloric region or resection of the vulnerable area. This method has given the author equally good results in ulcers situated both high and low. Operation is not denied to patients who come to the author in the most advanced state of organic debility. Sent and received as cancerous, their recovery is a happy disproval of the clinical diagnosis.

During the last few years there has been an endeavor to advance resection into the leading position, but this is destined to the same end as prior attempts.

To be a resectionist, owing to fear of cancerous degeneration and in the case of ulcers with chronic perforation leaving within the abdomen the fundamentals of the lesion by connection with the liver, pancreas, etc., is to lock up the wolf in the sheepfold. The radical operation is anatomically impossible in cases in which it is most necessary.

The author commonly practices posterior transmesocolic gastro-enterostomy with vertical implantation. The opening is generally made in the portion of the posterior face of the stomach immediately to the left of the pyloric antrum because in the great majority of cases the posterior face of the antrum forms adhesions with the transverse mesocolon.

Postoperative hæmatemesis was the only complication which the author observed in his gastro-enterostomies. No case of disturbances imputable to defective functioning of the anastomosis has been noted by him.

W. A. BRENNAN.

Ochsner, A. J.: The Safe Elimination of the Colon for the Relief of Uncontrollable Intestinal Stasis. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The operation described is applicable to patients suffering from intestinal stasis which cannot be controlled by diet, hygiene, exercise, and medical treatment. The treatment should not be applied in neurotics, because no surgical treatment is of benefit to this class of patients. It should not be employed in patients who can be successfully treated without surgical interference because they do not need this treatment.

The operation consists of the following steps:

The ileum is severed at the point which makes the anastomosis of its proximal end to the sigmoid flexure of the colon most convenient. The distal end is then carried out through a button-hole in the abdominal wall immediately in front of the cæcum, opposite McBurney's point, the fibers of the transversalis, internal oblique, and external oblique abdominal muscles being separated without being cut, in order that they may form a kind of sphincter to close the open end of the protruding intestine which is held in position by means of a few fine silk sutures. The sigmoid flexure of the colon is then severed at a point leaving the distal end in the best condition to make an anastomosis with the proximal end of the ileum.

A fairly soft rubber tube one centimeter in diameter should be carried up through the rectum and sigmoid beyond the anastomosis opening for a distance of ten centimeters into the ileum, as recommended by Lane, in order that there may be no accumulation of gas in the ileum proximal to the anastomosis opening, and in order that normal salt solution may be introduced directly after completing the operation by means of the Murphy drip. The sphincter ani muscle should be dilated very gently, but very thoroughly, in order to increase the comfort of the patient during convalescence.

The proximal end of the sigmoid flexure of the colon is then passed through an opening in the abdominal wall exactly opposite the opening on the right side, through which the distal end of the ileum was passed during the first part of the operation. The end is permitted to project for a distance of one centimeter and is fastened in place by means of a few fine silk sutures. This leaves the ascending, transverse, and descending colon and the omentum in their normal relations, able to protect the other intra-abdominal structures by their presence, while they are entirely eliminated so far as they can have any influence upon the causation of uncontrollable intestinal stasis.

Quarella, B.: Subcutaneous Traumatic Rupture of the Intestine in Free Hernia (Sulla rottura traumatica sotto cutanco dell' intestine in ernia libera). *Gior. d. r. Accd. di med.*, Torino, 1916, lxxix, 477.

Quarella gives a short historical review of the various theories regarding subcutaneous traumatic

rupture of the intestine, ruptures due to contusions, those due to dragging or pulling, and particularly the explosive or bursting theory advanced by Sauerbruch in 1903. This theory makes the following conditions indispensable in order that a rupture should be produced:

1. The intestine must be strongly distended.
2. The intestinal loop must be closed at the afferent and efferent ends: (a) by flexion of both ends, (b) by flexion of one of the ends while the trauma acts on the other, (c) by contemporaneous closure of the two free ends of the loop owing to trauma acting in distinct points.

3. There must be an abdominal contusion in the region of the distended loop. It was later shown by Bunge from a study of published cases and experimental work that if the abdominal cavity remains perfectly closed traumatic pressure is equally distributed over all the cavity and as long as the walls are integral a bursting fracture of the intestine could not occur.

Quarella thinks that the clinical eventuality of an intestinal rupture in a free hernia furnishes in practice one of the best elements for judging the debated question. Such clinical observations are rare. Quarella reports such a case in a man with a small left inguinal hernia. In this case after an oblique incision parallel to Poupart's ligament, a small hernial sac was isolated and opened; some turbid fluid with a fecal odor issued from the abdominal cavity. The external incision was enlarged and the intestinal loops in the vicinity carefully explored and found to be covered with abundant fibrinous purulent exudate and adhesions.

The third loop extracted showed, corresponding to the free margin, a solution of continuity involving the whole intestinal wall, and about the size of a cent. There was no visible sign of contusion. The breach was repaired, and the operation completed with drainage and the patient recovered. The history in this case showed the onset of violent pain immediately after a heavy muscular effort.

Clinically it has been demonstrated by some writers, that not only sudden increase of intra-abdominal and intra-enteric pressure in consequence of a trauma is sufficient to produce a bursting rupture in a hernia, but that such effect may be the result of a muscular effort. Roland and Campbell in 1906 reported an intestinal rupture from such a cause.

In the cases reported by Bunge the traumatism was exerted on the whole abdominal surface. The author compares his own case with that reported by Sauerbruch and a few others of the same kind in which the trauma acted directly on the hernial sac. Direct trauma therefore explains the mechanism of intestinal rupture in these cases.

The anatomopathological aspect of the perforation is important. While a rupture due to contusion may show in any point whatever of the intestinal loop, a bursting rupture is generally found on the convex margin of the loop and toward its

fundus where the pressure is greatest. The first kind has margins which are irregular and spotted with subserous ecchymoses, the latter is generally smaller, the greater diameter of the rupture is perpendicular to the intestinal loop, and the edges are clean and not contused. All these signs were present in the author's case.

In the operative treatment the author considers two points of capital importance: first to reduce operative maneuvers to a minimum so as to run less risk of diffusion of septic material; secondly, that the incision should be so low as to rationally satisfy the exigencies of drainage. In his own case he attributes the favorable result to the lateral oblique laparotomy incision.

W. A. BRENNAN.

Baird, B. D.: The Surgical Significance of the Uninflamed Appendix. *Med. & Surg.*, 1917, i, 94.

Observations on the manifestations of the subserous and the kinked appendix are recorded by the author.

The subserous appendix is, no doubt, brought about by the cæcum in burrowing its way through the parietal peritoneum in its descent, sweeping the appendix backward upon itself where it becomes imbedded in the cæcal peritoneum. These appendices appear as slender white cords covered by peritoneum and are often mistaken for adhesions. When dissected up a raw bleeding surface is left and there is no peritoneal covering to the appendix proper. The lumen is obliterated and there is microscopical evidence of atrophic degeneration.

In the kinked appendix, the kink is about one inch from the proximal end and is due to a contraction of the mesenterium. It is not a stricture. Thus a mechanical obstruction exists to the proper emptying of the appendix; this in turn irritates the cæcum which is followed by a disturbance of the rhythmic action of both stomach and intestines.

In both forms the symptoms are abdominal and nervous. In the former fall those symptoms of chronic dyspepsia and intestinal stasis, while in the latter fall those multitudinous complaints of the neurasthenic. There is no tenderness or pain in the appendiceal region. Stomach analysis shows results from normal acidity to hyperchlorhydria.

The diagnosis is not simple and the X-ray with bismuth is of great assistance.

Removal of the appendix will nearly always relieve the condition. In the author's series of 38, all but 2 report relief.

The article closes with a suggestion that possibly gastric carcinoma may in some way be correlated to these types of chronic appendices.

P. M. CHASE.

Mix, C. L.: Carcinoma of the Hepatic Flexure. *Med. Clin.*, Chicago, 1917, ii, 1236.

The patient, 51 years of age, entered the hospital complaining of swollen ankles and a swollen abdomen. That the patient had always been in perfect health until recently is surprising and of diagnostic

value, as a patient with ascites and oedema is usually ailing for some time. Four months before she noticed that her ankles were swollen at night and two weeks previous her abdomen began to swell, and after that she vomited frequently. She had no pain. Neoplasms in themselves are not painful. She had had no dyspnoea, which practically ruled out cardiac weakness, because in such a case the engorgement of the lung, reducing its elasticity and thus impeding expiration, invariably causes shortness of breath. This patient had oedema mainly at night, while a nephritic wakes up with oedema, and besides has a generalized swelling of the face, hands, and feet.

A portal obstruction, which is the third likely cause of ascites with oedema of the legs, was ruled out in this case because there were no evidences of an attempt to establish collateral circulation, no hæmorrhoids, no hæmatemesis, no large veins in the flanks, nor the very unusual although much emphasized caput medusæ. Wassermann was negative. Paracentesis revealed a large quantity of bloody fluid, rich in albumin, evidently an exudate. A mass of woody hardness, distinct from the liver, could be palpated in the region of the ascending colon. X-ray pictures showed a dilated cæcum which admitted no food for over five hours. A bismuth enema did not pass the hepatic flexure. The case was evidently a carcinoma of the hepatic flexure and should have an ileosigmoidostomy with resection of the carcinomatous colon if possible.

R. B. BETTMAN.

Mayo, W. J.: Transperitoneal Sigmoidotomy for the Removal of Tumors in the Mucous Membrane. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The large intestine and rectum are prone to the development of tumors of an adenomatous, papillomatous, infectious, or fibrous character. Multiple adenomata, commonly known as polyposis of the rectum, multiple papillomata or intestinal warts, and an infectious type in which small mucoid growths develop as the result of an inflammatory process in the mucous membrane, form well-defined clinical groups. The fibrous type are usually the result of secondary infections causing connective-tissue hyperplasia.

Many patients become extremely cachectic as a result of the hæmorrhages and exhausting discharges caused by these growths. For relief it occasionally becomes necessary to do a colectomy as far as the lower sigmoid. Later, by means of a snare, the cautery, fulguration, or radium, the remaining growths are removed from the rectum and rectosigmoid.

In the frankly infectious cases which develop mucoid growths the infection will subside following an ileostomy (Brown) whereby the entire large intestine is put at rest for six months or more. Occasionally this method of treatment will prove efficacious and result in cure in polyposis. A complete ileostomy gives less annoyance than a colos-

tomy; the stool soon becomes semi-solid, is easily caught in a suitable container, and is nearly free from odor.

A favorite seat of single polypi and localized papillomatous growths is in the lower sigmoid and rectosigmoid. When pedunculated, they can be removed through the sigmoidoscope by the cold wire. However, in this situation they are less frequently pedunculated, and may be completely sessile. Patients with such growths have blood, mucus, and purulent discharges from the rectum and a sense of uneasiness and gas in the lower sigmoid, signs and symptoms which call for careful sigmoidoscopic examination.

Attempts to remove sessile tumors located in the lower sigmoid through the sigmoidoscope are not unattended with danger, and perforation with death from septic peritonitis as the result of such more or less blind procedures has been reported. They may be malignant, and ineffectual removal may spread the disease. At the Mayo clinic transperitoneal sigmoidotomy has been found to be a simple, safe, and satisfactory procedure for the removal of these tumors.

The technique for removing such growths by transperitoneal sigmoidotomy is quite simple, and the illustrations which were made by Miss Fry from a recent case require little comment. The abdomen is opened in the midline, suprapubically, and a Balfour self-retaining speculum adjusted. The sigmoid is opened on the anterior longitudinal band as nearly opposite the tumor as possible and the tumor is exposed, drawn through, and double clamped. The growth is removed with the cautery and the defect closed from the mucous side by continuous sutures of chromic catgut after the method devised by Pilcher for the excision of hæmorrhoids and covered on the peritoneal side with a few interrupted silk sutures. The incision in the sigmoid is then closed with continuous catgut and interrupted fine silk and a rubber introduced into the rectum through the anus to prevent gas pressure.

LIVER, PANCREAS, AND SPLEEN

Starr, F. N. G.: Hypernephroma in the Folds of the Falciform Ligament of the Liver. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

The patient, a spinster aged thirty-five, complained of pain between the shoulders extending upward, headache, and a gradual loss of appetite. She was sallow, and weary-looking, with labored breathing; the bowels were regular and there was no menstrual disturbance.

Examination revealed a mass in the epigastric region, extending from the costal margin to about four inches below the umbilicus and a little to the right. On percussion there was dullness over this mass and over the liver, and resonance under the costal margin down to Poupart's ligament and between the end of the mass and the symphysis pubis. There was also a definite fluctuation wave,

and on palpation a distinct pulsation, and the stethoscope elicited a loud bruit. The stomach which was crowded to the left emptied on time, and renal function was normal.

The diagnosis lay between (1) an atypical pancreatic cyst, (2) a hydatid cyst of the liver, (3) a collection of fluid in the lesser sac due to a pathological closure of the foramen of Winslow; but to none of these did the condition exactly correspond.

At operation, through an incision a little to the left of the median line and extending from the ensiform cartilage to a point half way between the umbilicus and the pubes, an enormous reddish-brown tumor weighing 8.5 pounds and filled with thick gummous material was delivered. It seemed to have a broad attachment above and was found to be between the layers of the falciform ligament which were enormously stretched. By dividing this tissue close to the liver, the mass was removed without rupture. In closing the abdomen the cut edges of the falciform ligament were brought forward and sutured together with the cut edges of the peritoneum so that in case of recurrence the growth would be extraperitoneal and easy of access.

The patient made an uninterrupted recovery.

Soresi, A. L.: New Technique for Suture of the Liver (Nuova tecnica per la sutura del fegato). *Riforma med.*, 1917, xxxiii, 240.

The difficulty of suturing the liver is well known owing to the tendency of the sutures to cut the tissues comprised between them. Soresi describes his method of liver suture which he states allows very rapid, easy, and secure liver sutures.

The suture is made by means of very small wheels of fine silver wire. They vary from about 6 to 15 mm. in diameter according to the thickness of the part of the liver to be sutured.

The procedure is as follows: A No. 2 or No. 3 catgut is threaded on a long needle with a blunt point; the two ends, the same length, are knotted and are passed through two opposite openings between the spokes of one wheel and fixed by a slip knot, this knot being placed in the center of the wheel in such a way that it cannot disturb the passage of the thread through the liver or at the external part of the wheel. Then the needle carrying the doubled catgut is passed through the part of the liver to be sutured, the entry and exit points being as far as possible from the wound and equally distant from the wound. The catgut is then cut close to the eye of the needle; the two ends are threaded between two opposite openings in a second wheel and a surgical knot made which is tightened, drawing the two wheels together until it is seen that the edges of the wound are perfectly coapted. A second knot is then made to secure the first. The suture will be completed by as many similar stitches as the surgeon thinks necessary, using two wheels in each.

By this process there is complete avoidance of the sutures cutting through, and suture of the liver

can be done rapidly and securely. To the objection that can be made of foreign bodies being left in the abdomen, the author says that in the numerous experimental and clinical cases in which the liver was sutured according to this process the little silver wire wheels have never caused the least inconvenience, and the theoretical objection has no importance in practice. The use of silver is advisable because it has a marked electrolytic action which is of value in the prevention of infection and because this metal is best tolerated by the tissues.

The author will report more fully later with regard to the cases operated upon by this method among the war patients.

W. A. BRENNAN.

Judd, E. S.: Removal of the Gall-Bladder. *Illinois M. J.*, 1917, xxxi, 144.

The anatomy of the gall-ducts is considered and the function of the gall-bladder discussed.

Experimental data as to the effect of removing the gall-bladder is given. The investigation was made upon dogs, cats, and goats. In summarizing the data the following conclusions are given: After removal of the gall-bladder all the ducts outside the liver dilate. The sphincter at the entrance of the common bile-duct into the duodenum is the main factor in producing this dilatation. After cholecystectomy this sphincter can withstand only a small percentage of the pressure it normally maintains. When all of the muscle-fibers are dissected free from the intramural portion of the duct, the biliary tract does not dilate after the removal of the gall-bladder.

Judd gives the clinical review of ten cases more than fifteen years after cholecystectomy at their clinic. Gall-stones were found in the gall-bladder in each case. Seven gave typical histories of gall-bladder attacks and six of these were completely relieved by cholecystectomy.

After the removal of the gall-bladder certain changes take place which are practically compensatory. The common duct always dilates; the pressure in it is greatly reduced so that there is probably no back pressure in the pancreatic duct; and the patency of the sphincter is almost if not entirely overcome. It is evident that in most instances, at least, a person can live as comfortably without a gall-bladder as with one.

CARL R. STEINKE.

Fiessinger, N., and Montaz, R.: Contribution to the Study of Icterus Attributable to Chloroform (Contribution a l'étude des ictères dus au chloroforme). *Rev. de chir.*, Par., 1916, xxxv, 424.

Icterus is one of the most frequent end complications of chloroform, and owing to its importance from the surgical point of view the authors have made a detailed study of a postoperative case which occurred in the course of their ambulance practice. The complete clinical history and autopsy findings are given. This case showed, clinically, albuminuria, icterus, ataxodynamic nervous complications; chem-

ically, urobilinaria, urobilinæmia, no azotæmia; anatomically (autopsy) marked hepatorenal degeneration.

Experimentally the noxious action of chloroform is well known. In 1866 Nothnagel provoked visceral and hepatic degeneration in dogs by subcutaneous injections. Similar results have been demonstrated by many others. In 1901 Fiessinger in a previous investigation showed the extreme fragility of the hepatic cell in the presence of chloroform intoxication. Lesions of the liver are evident within half an hour after injection. The attack on the cell is manifested by exhaustion of its reserves and by nuclear hyperplasia. When massive degeneration appears it predominates in the center of the lobule, and the liver of the intoxicated animal shows on the fourth day the same centrolobular necrosis with the phase of nuclear reaction which the authors observed in the case of icterus now reported. The experimental findings of Tuffier, Potherat, Doyen and Policard, and Whipple and Sperry confirmed the results of Fiessinger as regards the dangers of chloroform anæsthesia, owing to the extreme fragility of the liver in the presence of chloroform.

The authors think the reasons for this particular effect of chloroform must be sought in the law of Hans Meyer and Overton, viz., that the anæsthetic properties of substances vary according to power to dissolve fatty and analogous bodies (lipoids). Since the liver is rich in lipoids it fixes a large quantity of chloroform, but the action is more complicated. It is known that 50 per cent of the chloroform is decomposed in the organism. Such destruction necessitates the disappearance of alkali which is borrowed from the blood. If for any reason the restitution of alkali is insufficient there results considerable metabolic and toxic changes.

The authors review the various forms of icterus resulting from chloroform narcosis, the benign, grave, and nervous forms. These postoperative forms of icterus may be divided into two pathogenic groups: (1) chloroformic hepatogenous icterus, occurring after prolonged narcosis and manifested by cerebral phenomena, coma, oliguria, etc., and terminating by death; (2) chloroformic hæmatogenous icterus, slight in type, not accompanied by renal or hepatic symptoms, and from which there is usually recovery within a few days. In the first group the action of chloroform is on the liver; in the second the action is confined to a greater or lesser destruction of the red globules, because if chloroform is hepatolytic it is also hæmolytic. It has been demonstrated that cholæmia is constant after chloroform anæsthesia. It is strong eight hours after operation and obtains its maximum in from 24 to 36 hours. It seems to result from hæmolysis, because in some cases there has been observed an early and transitory diminution in the resistance of the red globules.

From the various findings and reports in the literature the author believes that in hepatic and cirrhotic

patients, chloroform anæsthesia should be avoided and replaced by ether which both experimentally and clinically shows a much less hepatotoxic power than chloroform. But in any case chloroform should be handled with prudence, and the surgeon should beware of grave icterus and chloroformic hepatonephritis.

W. A. BRENNAN.

MISCELLANEOUS

Starr, F. N. G.: The Acute Abdomen. *Canad. M. Ass. J.*, 1917, vii, 399.

Palpation of the abdomen after the anæsthesia has greatly reduced the muscle spasm will often enable the surgeon to make a more accurate diagnosis in the "acute abdomen." The location of the appendix can often be determined and the choice of incisions be guided by this. In pelvic abscess the mass can at times be felt, in acute obstruction a particularly tense bowel just above the obstructing point is often noted. A sausage-shaped mass is felt in intussusception and points to its location, while palpation of a distended gall-bladder clinches the diagnosis of a cholecystitis, or the absence thereof may often warn the surgeon that an incorrect diagnosis has been made. In typhoid perforation the perforated coil of bowel is already much thickened from the ulcerative process and can at times be palpated.

R. B. BETTMAN.

Hughes, G. S., and Rees, W. A.: Abdominal Surgery at an Advanced Operating Center. *Lancet*, Lond., 1917, cxcii, 642.

Of the 640 cases of severe injuries to the abdomen, head, or chest, received at this advanced operating station in six months 263 were wounds of the abdomen. The authors discuss the question as to whether the wound is penetrating, the choice of cases for operation, and the treatment. They give a table which shows the data in a series of 110 cases of laparotomy.

As to the results, the nearer the front the operating center is situated, and the earlier the cases are brought to it, the higher will be the mortality, owing to more patients arriving alive who would have succumbed if they had been transported farther back. At the same time, one hopes that more lives are saved. Statistics of necessity must be somewhat fallacious, as the majority of patients have multiple wounds involving other parts of the body besides the abdomen.

The results of six months' work are summarized as follows:

Total number admitted with abdominal wounds, 263.

Recovered, 136, or 51 per cent. Died, 127, or 49 per cent.

Total number admitted "with penetration," 180.

Total number on whom laparotomy was performed 110.

Recovered, 46, or 41.5 per cent. Died, 64, or 58.5 per cent.

Laparotomies performed where wounds of solid viscera alone were found, 21.

Recovered, 13, or 62 per cent. Died, 8, or 38 per cent. Laparotomies performed for injuries to hollow viscera alone, 62.

Recovered, 22, or 35.5 per cent. Died, 40, or 64.5 per cent. The relative frequency was: stomach 14; small intestine, 60; large bowel, 40; rectum, 3; liver, 24; spleen, 11; kidney, 14; bladder, 3.

P. G. SKILLERN, JR.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Bronson, E.: Fragilitas Ossium and Its Association with Blue Sclerotics and Otosclerosis. *Edinb. M. J.* 1917, xviii, 240.

The author tells of two families with hereditary fragility of the bones associated with grey-blue sclerotics, and associated with otosclerosis also in one family. A summary of the literature of these peculiarities in relation to fragilitas ossium is presented, together with a general discussion of the whole subject.

Two cases presented by Bronson are fairly typical examples of osteogenesis imperfecta of prenatal onset. They both have had numerous fractures without violence since birth, and both show signs of imperfect ossification of the cranial bones. Another case illustrates fragility of the bones of postnatal onset, but the shape of the head also suggests softness of the cranial bones in early life.

The terminology is varied. The author believes that Looser's terms — osteogenesis imperfecta congenita and osteogenesis imperfecta tarda — are the most satisfactory.

The etiology is unknown. The hereditary factor is present in only a limited number of cases.

Clinically the condition is characterized by defective cranial ossification and by numerous fractures without violence. The earlier the onset the greater is the liability to fracture. Dislocations also occur. Blue sclerotics may or may not be associated.

A limited number of metabolic studies indicates an increased loss of calcium.

In both prenatal and postnatal onset of symptoms pathologic findings indicate a deficient functional activity of the osteoblasts. In respect to other abnormalities writers disagree.

P. G. SKILLERN, JR.

Elliott, C. A., and Nadler, W. H.: The Effect of Castration upon Osteomalacia in the Male. *Am. J. M. Sc.*, 1917, cliii, 722.

The authors report a case of osteomalacia in an adult male treated by castration. Osteomalacia is a very rare disease in the male. Its cause is unknown, although it has been attributed to infection, errors of nutrition, and perverted glandular function. McCrudden is reported as believing that the balance of bone metabolism is disturbed by ex-

cessive demands for calcium, as in pregnancies, bone tumors, or fractures. The empirical treatment with phosphorus, adrenalin, pituitrin, thyroid extract, arsenic, etc., leaves much to be desired. Fehling in 1887 recommended castration in the treatment of osteomalacia in women and since then as high as 80 per cent cures have been reported by some writers, although many believe that the value of castration lies only in the prevention of future pregnancies. Contrary to expectation metabolic studies after operation do not reveal a mineral retention. The authors report, as far as they know, the first case of osteomalacia in a male treated by castration. Five years later no actual improvement in bone structure was noted, although the operation may have influenced a probable remission which had occurred. The authors do not believe that osteomalacia is caused by disturbance of the sexual glands.

R. B. BETTMAN.

Ogilvie, W. H.: Penetrating Wounds of the Knee-Joint (Plaies pénétrantes de l'articulation du genou). *Lyon chir.*, 1917, xiv, 134.

The author's article is based on a series of 52 consecutive cases of penetrating wounds of the knee-joint. Realizing the necessity of preserving the function of the joint, the author adopted conservative methods which he found involved no additional risks and gave very satisfactory results. His principle has been to avoid operation whenever possible; and where undertaken it has been of as limited a nature as the circumstances allowed and chiefly directed to the removal of foreign bodies and cleansing the area of the wound. Reliance is placed in the first instance on the resisting powers of the synovial membrane which seem to be especially effective against an infection by gas-forming organisms. For immobilization the whole limb is slung from a frame which is a modification of the Blake fracture splint. Operation consists in excision of the projectile trajectory, lavage of the joint with 5 per cent saline solution, suture of the wound, and lastly injection of 10 ccm. ether into the joint. A tourniquet is applied in all operations, great importance being attached to the elimination of injurious handling which is effected by this means.

The results in the treatment of the 52 cases were: 31 clean, mobile joints; 7 joints clean but mobility limited; 11 stiff limbs; 2 amputations; 1 death.

In the treatment of such injuries the author calls special attention to the extreme importance of immobilization, the necessity for which precaution is

far from being sufficiently realized, particularly in the transportation of the wounded. In a wound of the knee-joint insufficient immobilization may lead to the diffusion of infection through the joint or penetration of the capsule by the projectile which was previously extra-articular.

Experience in this has shown that drainage of the joint is not only unnecessary if intervention is made before infection is noted, but that its employment as a matter of routine is to be condemned.

W. A. BRENNAN.

Clark, I.: Nail Puncture Wounds of the Foot: Results in 100 Cases. *Boston M. & S. J.*, 1917, clxxvi, 541.

The technique was the same in all the cases though the treatment was administered by different doctors and nurses. Sixty-two per cent of the injuries occurred on the ball of the foot and most of these near the center of the ball. The left and right foot was hurt about the same number of times. In none was there evidence of a nail having penetrated the tendon sheath of the flexor tendons, or of injury to the tendon. Most of the cases were treated within 15 or 20 minutes after the accident.

The technique used, that recommended by Dr. W. G. Hudson of the DuPont Powder Co., was as follows: The foot is thoroughly washed with hot water and soap. This is done thoroughly and rapidly, very hot water being used. The foot is then dried, and an area about 2 inches square around the puncture wound is thoroughly washed with alcohol. The sole of the foot is then painted over with commercial gasoline, and after this has evaporated one or two coats of iodine tincture are applied in and around the wound. A sterile probe is then passed into the wound without pressure, and finds its way to the full depth of the wound. It is important that this manipulation be done gently. After the probe fills the entire wound tract a hypodermic syringe is filled with 10 ccm. of iodine. The needle is inserted along the probe to the bottom of the wound and the iodine injected slowly and allowed to run out along the probe. It is followed by some pain.

The total number of dressings was 194 with a total loss of time of 29 days for all cases. The longest time lost was 7 days. Three cases were infected when they came for treatment having delayed 24 hours or more in coming. In no case did tetanus develop.

CARL R. STEINKE.

FRACTURES AND DISLOCATIONS

Blake, J. B.: Infection of Simple Closed Fractures. *Boston M. & S. J.*, 1917, clxxvi, 628.

Blake has seen during the last 20 years 10 or 12 cases of infection of simple closed fractures at the Boston City Hospital. By this he means an infection which parallels, both in intensity and dura-

tion, the infection in compound fractures. Three cases are given in brief.

The conclusions are:

1. Infection complicating closed (simple) fractures is an infrequent, but serious complication.

2. The infection may be blood-borne; or it may enter through abrasions, minute scratches, or blisters; occasionally, through a hair follicle.

3. It is most apt to occur in the presence of severe trauma, and in cases in which the skin is unusually dirty, and the general resistance of the patient unusually low.

4. Preventive treatment consists in a very thorough cleansing of the skin, and an aseptic treatment of superficial scratches and blebs. Once infection is established, thorough drainage and the Carrel method are indicated.

5. The prognosis is usually good, though duration is usually long.

In closing the discussion Blake says: "It is possible, therefore, that some cases of delayed union are complicated by what might be called a 'silent' infection."

CARL R. STEINKE.

SURGERY OF THE BONES, JOINTS, ETC.

Auvray: The Immediate Results of Surgical Intervention in 111 Cases of Purulent Arthritis of the Large Articulations (Resultats immediats de l'intervention chirurgicale dans cent onze cas d'arthrites purulentes interessant les grandes articulations). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 683.

All of the 111 cases observed by Auvray were clearly purulent. They occurred in the rear hospitals several days and even weeks after injury, and the arthritis had been overlooked.

Only the immediate results of intervention are reported as the majority of the patients could not be followed up. The 111 cases comprised: 34 purulent arthritis of the knee, 32 purulent arthritis of the elbow, 20 purulent arthritis of the shoulder, 12 purulent arthritis of the ankle, 7 purulent arthritis of the wrist, 4 purulent arthritis of the hip, 2 purulent arthritis of the sacro-iliac joint.

Of the series 8 patients died, global mortality, 7.2 per cent; 12 were amputated, all being of the lower limb. All the shoulder arthritides have had to be resected.

Auvray says that the results show very clearly the great gravity of purulent arthritis of the lower limb, there being 12 amputations and 6 deaths; especially the knee-joint lesion which is incontestably the most severe. Also he points out how powerless an arthrotomy is in stopping the evolution of infected joint complications.

After several such drainage operations resection has had to be resorted to, resulting in the cure of the patient. In many of the cases the bad results are due to faulty and insufficient arthrotomy methods and other causes; but Auvray's experience leads him to think unfavorably of simple drainage operations,

as resection in his experience has saved many lives and limbs.

He points out the necessity for early diagnosis and treatment at the surgical stations at the front. On the preliminary dressings, especially in the case of purulent arthritis of the knee, often depends the future of the limb, and even the life of the patient.

W. A. BRENNAN.

Gaudier, H., and Montaz, R.: Arthrotomy Followed by Immediate Closure of the Articulation in the Treatment of Certain Wounds of the Knee (De l'arthrotomie suivie de fermeture immédiate de l'articulation dans le traitement de certaines plaies de guerre du genou). *Lyon chir.*, 1917, xiv, 77.

The immediate suture of the synovial membrane after arthrotomy in knee-joint wounds requires the following conditions: (1) prompt surgical intervention, (2) complete excision of all injured tissues after extraction of foreign bodies, (3) very careful hæmostasis, (4) the possibility of supervision of the patient during the first few days, (5) thorough immobilization.

In a series of fifteen cases reported by the author the average time elapsing between injury and operation was from six to ten hours. In some cases it ran from twenty-four to seventy-two hours. Satisfactory results were obtained in all except one case which became transformed into septic arthritis. Such good results are to be explained by the long period that articular fluid may remain sterile in spite of existing infection of the surrounding tissues and the presence of the bacillus perfringens on the projectiles, which fact is known from the researches of Feissinger.

The indications after X-ray examinations are:

1. Surgical cleansing of all soft parts; excision of wound edges and injured tissues; thorough hæmostasis.

2. Wide parapatellar arthrotomy, saving the quadriceps tendon if possible.

3. Very careful cleansing of bone injuries; extraction of the projectile by curette if in the bone; scraping the whole fracture area and smoothing of bone edges.

4. Lavage of the articular cavity by hexamethylene or ether.

5. Suture of the synovial membrane by isolating, if possible, the bone injury from the main cavity of the joint. A small plug of gauze is left in the bone cavity and removed after twenty-four hours. In suitable cases there should be suture of the soft parts above the closed synovial membrane, followed by immobilization of the limb.

The evolution is nearly always simple; but there may be a slight rise of temperature during the first days. After two weeks when all inflammatory reaction has vanished, mobilization may be begun.

Contra-indications are: clinical signs of infection; great destruction of soft parts rendering suture impossible; serious bone injuries calling for primary resection.

In the author's 15 cases, 14 recovered with a movable joint; 1 recovered with ankylosis.

W. A. BRENNAN.

Grant, H. H.: The Open Treatment of Certain Fractures of the Long Bones. *Am. J. Surg.*, 1917, xxxi, 102.

The author presents the following plan of treatment. In all fractures involving the shaft of the humerus or femur, as well as the tibia, in which the X-ray shows that the approximation is bad, he advises early operative intervention by fixation, after a plan which he describes. Where observation shows at any time, shortening or angulation, with or without failure of union, these steps are to be entertained and no delay is to be allowed where the X-ray shows unallowable failure of approximation.

In the device described in this article the shaft of the gimlet is made of the same material as the ordinary wood screw. The shaft is from 2.5 to 3.5 inches long and 2.5 to 3 mm. in diameter. The handle, which is fitted firmly upon the shaft, is more or less malleable so as to be bent, if necessary, by a pair of strong pliers into adaptable shape. A simple folding clamp with a set screw, holds the two handles in apposition, after their introduction into the bone. It is found that about three inches is all that is necessary for the length of the handle and three-quarters of an inch in breadth.

The patient is prepared in the usual manner, which, in simple fractures, should be delayed two or three days, until the acute stage has subsided. By the use of a suitable pair of forceps the two ends are brought in apposition, after a free and liberal removal of all obstruction in the soft parts or bone. After the parts have been placed in the desired position, with a small hand drill, a hole is made in the bone and the gimlet screwed into it. This opening is made about 1.5 inches from the point of fracture and a corresponding hole is made in the other fragment and the other gimlet introduced and the handles approximated. The depth to which the screw penetrates depends upon the firmness of the hole obtained. Usually it is completely through the medullary canal and should involve the opposite side of the shaft. Lane's technique is desired and aimed at.

Slightly imperfect apposition, rather than prolonged manipulation is advised, nor should too much manipulation be made with the gimlet after its introduction, lest the hole in the bone be loosened. A stab wound is made upon either side of the wound to expose the fracture, and through this stab wound the shaft of the gimlet is introduced into the drilled hole in the bone and a similar stab wound made upon the other side of the fracture and the other shaft introduced. A second pair of gimlets is then applied through the open wound as described above.

After the clamp has been placed upon the handle and the adjustment is satisfactory, the periosteum is closed by catgut sutures. If it seems necessary to

fortify the approximation, a catgut suture may be carried around the seat of fracture and tied about the shafts of the gimlets in any way indicated.

The muscles are drawn together and the skin closed well up around the shafts of the gimlets. In some instances Grant advises that the wound be mopped out with a solution of iodine. Careful hæmostasis should be secured and no drainage is necessary. The author believes that if two pairs of clamps have been employed, a plaster-of-Paris bandage should be unnecessary, whereas, if only one pair is used, he believes that the limb should be secured by a light plaster-of-Paris bandage, engaging the joints above and below the point of fracture. Gauze dressing is carefully wound around the shafts for protection, and a window is cut above the wound to permit inspection.

The gimlets are allowed to remain in place eighteen to twenty days or even longer. If an infection should take place, the foreign bodies must be removed at once.

The author has used this method in eight cases, with perfectly satisfactory results in all, and with infection but once, in which case there was firm union with good function.

The advantages of this method of fixation over Parkhill's clamps, according to the author, are that it is very much simpler and easier of application, and far less cumbersome and the practical results are, in every way, satisfactory. The great advantage over the Lane plate, he believes, is that there is no foreign body left to cause trouble afterwards and that, inasmuch as an accurate fixation, maintained for seven or eight days will insure satisfactory union in nearly any healthy individual, it is easier to remove the clamp any time after the end of the two weeks, if occasion arises. Furthermore, the fixation is far more firm than can be obtained by the use of wire or other suture.

E. C. ROBITSHEK.

Calve, I.: A Method of Bone Coaptation by Autobolting Without Graft or Metallic Sutures
(Sur un procédé de coaptation osseuse par auto-enchévillement sans greffon ni sutures métalliques).
Presse méd., 1917, p. 212.

The object of the method described by Calve is to obtain a diaphysary shortening. The most frequent indication for this is the shortening of a healthy femur where there is accentuated lameness due to considerable inequality in the length of the two limbs, subsequent to a thigh fracture, etc. This procedure was described by Calve in June, 1916. The method then described of shortening the healthy femur, while satisfactory, was difficult of execution and called for much time.

Calve now describes a new method of shortening the femur, viz., autobolting which will be better understood from the illustrations than from a lengthy description. The technique is very simple and by the special instrumentation and method which he describes Calve says it can be executed in less than a quarter of an hour. This method gives



Fig. 1.



Fig. 2.

Figs. 1 and 2. Showing method of preparing bone for coaptation by autobolting without graft or metallic sutures.

a very exact coaptation, and if the upper diaphysary cylinder is not an exact prolongation of the lower one, parallelism of the two fragments is maintained, the surfaces in contact are extensive, and the lines of force and transmission of pressure are preserved.

Instead of removing a piece of the femur exactly equivalent in length to the amount of shortening required, as in his first method, he now removes almost as much, but leaves a piece about 3 cm. long and in width equal to the diameter of the medullary canal of the upper fragment. This piece is a regular bolt which is introduced into the medullary canal and gives an excellent coaptation of the fragments. If the section of the bone is made obliquely as shown in the figure the bolting-in is perfect, the two fragments slide over each other and a very intimate contact is effected.

W. A. BRENNAN.

Delbet, P.: Results of Treatment of Pseudarthroses of the Neck of the Femur by Bone-Graft Without Arthrotomy (Résultats du traitement des pseudarthroses du col du fémur par la greffe osseuse sans arthrotomie). *Bull. Acad. de méd.*, Par., 1917, lxxvii, 530.

Delbet in 1908 and 1912 published his method of treatment of pseudarthroses of the neck of the femur by bone-grafts.

Cervicotrochanterian fractures (extra-articular) usually consolidate by an osseous callus and there is

little functional disturbance if properly treated; but decapitation and transcervical fractures which are intra-articular usually terminate by a pseudarthrosis. Loss of function is almost complete and this is so much the worse because such fractures usually occur in the young.

The bone-grafts used by Delbet vary in size from 6.5 to 11 cm. in length, and are completely deperiostized. That the grafts live is proved by radiographs made not only during two or three years but by the fact that in the case of two grafts which broke consolidation was effected. In pseudarthroses which are recent new bone is produced between the surfaces of the fracture. In four of his cases new ossification was visible on the radiographs and in one case the neck appeared to be completely reconstituted.

Rapidity of functional restoration after operation depends on the age of the pseudarthrosis and on muscular atrophy. Where operation is deferred till late impotence will persist, while it is much reduced if patients are operated upon early. In future operation ought not to be delayed longer than in the case of an ordinary femur fracture.

An old pseudarthrosis has the disadvantages not only of rendering regeneration of the bone difficult if not impossible, but also because owing to the widening of the interfragmentary space the size of the graft must be increased, thus exposing it to fracture. But neither the age of the pseudarthrosis nor the age of the patient is a contra-indication.

Delbet counts 14 operated cases and only one

did not obtain great benefit. All the other 13 walked easily. Three are still under treatment with excellent indications. W. A. BRENNAN.

Putti, V.: Hæmi-articular Osseous Transplant for Pseudarthrosis of the Shoulder (Trapianto osseo-emiarticolare per pseudoartrosi dell'omero). *Clin. chir.*, Milano, 1916, xxiv, 1326.

The author reports the case of a boy of 14 years with a comminuted supracondyloid fracture of the left humerus. There was non-union and a pseudarthrosis resulted. After eight months as the forearm was almost completely useless the author decided to intervene. The humeral epiphysis was found reduced to a small knot with cartilaginous covering and was removed. The lower third of the left fibula was removed with its epiphysis and periosteum. The lower extremity of this graft was fixed to the lower stump of the humeral diaphysis by shaping and inlaying the one to the other. Firm union was maintained by a metallic ribbon stretched by the author's special apparatus. In this way in the place of the lower humeral epiphysis was found the upper fibular epiphysis; this articulating with the glenoid cavity of the ulna re-established the articular relations. The joint was further consolidated by plastic operation on the capsule. After immobilization in a plaster apparatus for five months, movements were begun. Six months after intervention the graft was found firmly attached to the humerus. There was no pain either on passive or active movements of the elbow; articulation of the elbow was well established. W. A. BRENNAN.

SURGERY OF THE SPINAL COLUMN AND CORD

Kinney, L. C.: Lesions of the Fifth Lumbar Vertebra. *Med. & Surg.*, 1917, i, 75.

The fifth lumbar vertebra is unique in two respects. It presents more frequent congenital anomalies than any other bone in the body and in contrast to the other vertebræ it is in close relationship with three relatively fixed bony masses. There may be metastatic deposits of infection or malignancy and the exostoses of spondylitis deformans. It is subject to violent injury with fracture and fracture dislocation. The most frequent and most important lesions in this vertebra are due to injury of its ligaments. Congenital departures from the accepted normal are usually innocuous and often discovered accidentally. Henderson reported 17 cases discovered by roentgen examination and in only 3 were there symptoms referable to the condition.

Four cases of sacralization of the fifth lumbar vertebra are reported. The treatment recommended is:

1. If the case is of long standing, manipulation under ether to mobilize the vertebra and break up

the adhesions should precede the application of the cast.

2. Hyperextension of the lumbar spine and fixation by means of a double plaster-of-Paris spica from the knees to the chest.

3. Where there is excessive deformity and it is impossible to separate the abnormal process from its point of impingement, or where there is a true accessory articulation the traumatic lesions of the vertebra do not yield to external fixation. Either excision of the abnormal process or some form of internal fixation is usually necessary.

Adams removed the abnormal transverse process in 1910. Shackleton reported 17 cases where the process was removed with good or perfect results in 14. The removal of the process is difficult because of its deep situation, interference of the ilium, and the danger of injury to the sacrolumbar plexus. Harding recommends fixation of the vertebra to the sacrum by an Albee graft and the destruction of any accessory joint by an electric burr directly through the wing of the ilium.

PHILIP LEWIN.

Leighton, W. E.: Laminectomy for Different Lesions of the Spinal Cord. *Interst. M. J.*, 1917, xxiv, 368.

From personal experience with the operation of laminectomy the author concludes that it is a relatively safe procedure, and that it should be undertaken in many more cases; frequently it is postponed until too late to be of any benefit. After experimenting with the various methods of anæsthesia, he concludes that intratracheal insufflation of ether is the safest, because there is no danger of respiratory failure, and the most convenient, as the anæsthetist is out of the way. The patient is placed flat on his abdomen, and the shoulders raised by means of rests or sand-bags placed parallel with the body under the outer ends of the shoulders. The head must be supported by a head-rest, or by an instrument table in cervical cases.

In the lumbar or lower dorsal regions a curved incision is made through the skin and fat down to the vertebral fascia and this flap dissected back to the spinous processes. The laminae are cleaned of muscle with a periosteal elevator, and hæmorrhage checked with hot packs. In a few minutes the inter-spinous ligaments are divided with a knife and the spinous processes excised with a bone-cutting forceps. The Hudson burr is used to trephine the spine, except in the presence of fractures. Small pieces of the laminae remaining after the use of the burr are removed with the rongeur forceps. According to some authorities, the sudden escape of spinal fluid does no harm, but the author always lowers the head of the table before opening the dura, and the escape can be controlled if necessary by a small pledget of cotton inserted between the dura and the cord at the upper end of the wound. In all except infections of the cord, the wounds are closed without drainage.

The following are the indications for operation according to the author:

1. The presence of tumor formation of the spinal meninges or substance of the cord.
2. Fractures of the vertebræ where the symptoms do not show a complete destruction of the cord at the site of injury. Otherwise as far as improvement is concerned the operation is foredoomed to failure.
3. Injuries from foreign bodies as bullets, shrapnel balls, or bits of casings of high explosive shells.
4. Abscess formations following injuries or disease.
5. Meningitis, either localized or diffuse.
6. Spastic contractions and painful affections of the limbs.
7. Any questionable condition where exploration might prove of benefit.

GATEWOOD.

Neuhof, H.: Some Observations on Spinal Cord Surgery. *Ann. Surg.*, Phila., 1917, lxxv, 410.

The results of prolonged observation of the effects of spinal cord lesions — principally traumatic ones — and the effects of various operative procedures upon such lesions are grouped under various heads.

Under the first head is discussed fascia transplantation into defects of the spinal dura. After reviewing former methods and showing their inadequacy the author concludes that this is the correct clinical method of treating large defects of the spinal dura. Fascia transplantation in the spinal dura has a distinct advantage over its implantation into the cerebral dura, for, in contrast, adhesions between the transplant and the underlying cord were not observed even after prolonged periods (more than a year). The inner surface of the transplant is sutured into and not over the defect of the spinal dura.

In discussing the operative treatment of recent spinal cord injuries, indications and contra-indications, the author presents his reasons for assuming an extremely conservative stand for surgical interference in spinal cord injury, and offers two definite indications calling for operation for fresh spinal cord injuries in civil practice:

1. Progressive intraspinal hæmorrhage, as indicated by repeated lumbar puncture.
2. Unquestionable X-ray demonstration of a fragment of bone encroaching upon the spinal cord at the level to which the neurologic manifestations point.

Neither of these is an absolute indication for operation if the manifestations of cord compression are not severe.

In discussing the limitations of roentgenography in the diagnosis of spinal injuries the author emphasizes the fact that a negative roentgenogram by no means excludes the existence of an intradural injury, citing an illustrative case.

As to the diagnostic and therapeutic value of lumbar puncture in spinal injuries, first as a diagnostic measure it has proven of such great significance that it is now employed as a routine in all cases of suspected or of evident spinal injury. Its value lies, of course, equally in the demonstration of the presence or of the absence of blood in the cerebrospinal fluid. The precaution should always be taken to collect the spinal fluid in two or three test tubes in order to exclude possible trauma made by the puncture needle. The therapeutic value of the withdrawal of subdural collections of bloody fluid is evident, particularly in those cases for which operative procedures are not indicated; yet lumbar puncture for such purposes finds no advocates.

As to the surgical treatment of post-traumatic deformity of the spine (Kuemmel's disease) with spinal cord symptoms, the author states that while this condition is far from rare, it is barely mentioned in American literature. Post-traumatic deformity of the spine may develop after injuries ranging from mild to very severe, and from direct or transmitted violence. Three stages in the symptomatology can usually be recognized. The primary one is that of the immediate manifestations of the injury, lasting for a varying length of time, and of varying degrees of severity. The second phase, the "free interval," is characteristic. Occasionally the free interval is of very brief duration, or hardly can be said to

exist; in most instances, however, it is quite definite, and of weeks' to months' duration. The third stage is the development of kyphosis, sometimes angular but usually more diffuse, with the return of some or all the symptoms of the first stage or the appearance of new manifestations. In some cases the progressively increasing deformity of the vertebral column is the sole manifestation of the third stage. The pathogenesis of Kuemmel's disease has not as yet been definitely established, chiefly because necropsies are not obtained during its evolution. According to one group of observers the lesion is a fracture of the vertebral body which, when not distinguishable radiographically, is presumed to be in the nature of fine linear fissures. The theory of a rarefying osteitis without fracture has been advanced by others. The treatment of Kuemmel's disease has, up to the present time, consisted in the application of plaster jackets and, later, lighter corsets. Neuhof wishes to advocate operation for the group of cases in question, basing his opinion upon these considerations and upon the results he has obtained by laminectomy in three cases.

As to the indications for operation in post-traumatic lesions of the spinal cord other than Kuemmel's disease, Neuhof states that the late effects of spinal injuries and the possibilities for their relief by operation have been emphasized recently by Elsberg, who described various lesions among which were: narrowing of the spinal canal by callus; pressure upon the cord by displaced fragments of bone or by one or more vertebral bodies; fracture of a transverse process producing root pain; rupture of the ligamenta subflava, and fibrous bands constricting the cord.

The author adds four cases from his own experience: (1) cystic subdural collection of fluid following injury to the thoracic spine; (2) adhesions and compression of the cauda equina following injury; (3) post-traumatic sclerosis of the cervical cord; (4) post-traumatic sclerosis of the cervical cord. The author states that if the symptoms of cord injury have been of very prolonged duration, the chances

for much improvement are slight, and it is particularly for this group of cases that the indications for operation must be most sharply drawn.

A case of pneumococcus epidural abscess secondary to chronic localized osteomyelitis is presented and discussed. Tuberculosis, syphilis, and actinomycosis are the causes of the great majority of cases of chronic osteomyelitis of the vertebrae; any one may result in the formation of an epidural abscess. In most cases the ordinary acute osteomyelitis of the spine does not produce spinal cord symptoms; in exceptional ones such symptoms are referable to a widespread involvement of the spinal meninges.

As to the significance of the disappearance of reflexes and of retention of urine after laminectomy, Neuhof believes that they are the results of mild injuries to the spinal cord at operation, from the necessary operative manipulations involved in the removal of tumors and the treatment of other lesions.

Some observers maintain that the loss of reflexes and of sensation, with corresponding loss of muscle tone and power, are permanent after injury to the cauda equina, and that, therefore, the sole indication for operations for such injuries is the relief of pain. The author believes that this view is not correct, for relatively recent cauda injuries at any rate.

Concerning the significance of bed sores the author states that in every instance a decubitus could be directly ascribed, not to the disease from which the patient was suffering, but to the care given the patient. Cases have been admitted, with numerous bed sores, in which these lesions have cleared up with adequate care and despite the fact that the spinal affections from which the patients were suffering were irremediable.

Neuhof concludes his paper with the statement that although many advances have been made in spinal surgery in recent years, the whole subject is as yet in an early stage.

P. G. SKILLERN, JR.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Robin, A.: The Relation of Diabetes and Cancer (Les rapports du diabète et du cancer). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 481.

In 1898 Kappler found 62 cases of cancer in diabetics reported in the medical literature. Naunyn and Frerichs found the percentage varied from 1.5 to 2.4. Boas in 55 cases of cancer of the digestive tract found coincident diabetes in 12 cases. Robin's personal statistics show that in 144 patients dying from diabetes there were 12 cases of cancer, or 8.3 per cent. He thinks that the evolution of a cancer is certainly influenced by the existence of an ante-

rior diabetes, particularly when it is a question of a tumor of rapid development. In 9 of his 12 cases the cancer was of this kind. It also seems to Robin that there is some relation between the rapidity of the cancer growth and the intensity of the glycosuria. He has never seen cancer patients develop diabetes and does not believe that such occurs, except perhaps in the rare cases of pancreatic cancer.

With regard to the influence exercised by cancer on diabetes which preceded it, Robin states that in the minority of cases while there is slight recrudescence of glycosuria in the beginning of the cancerous period, this elevation is temporary only, and that in the majority of cases sugar diminishes or disappears entirely.

The opportuneness of surgical intervention in the case of a diabetic is, according to Robin, open to discussion. Published observations show that there may be either an increase or decrease of sugar following operation. Operation upon a diabetic patient for cancer is always serious on account of the frequency of coma after operation. Abstention should be the rule when the urine shows acetonc products and when the patient is enfeebled by the double malady. But intervention is indicated in the initial periods of the cancer even when the diabetes is advanced, since it appears to be demonstrated that diabetes accelerates the progress of cancer, and otherwise operation assures a prolongation of life.

W. A. BRENNAN.

Roffo, A. H.: New Transmissible Spontaneous Tumor in the White Rat (Nuevo tumor espontaneo trasmitible en la rata blanca). *Prensa méd. argent.*, 1917, iii, 320.

Roffo found in a white rat a primary tumor of the liver with metastases in the peritoneum and omentum. A biologic fact of importance in the development of familial cancer is that this tumor was only transmissible in rats of the same species and the tumors developed always preserved their distinct histologic type.

The histology of the primary tumor calls attention to the polymorph elements which form it. These polymorph elements are irregularly grouped and at times it is difficult to distinguish the neoplastic cell from the stroma. The tumor has the characteristics of a mixed neoplasm as described by Hausland, according to whom the large polymorph elements are carcinomatous cells surrounded by fusiform sarcomatous elements.

In transmission it is necessary to preserve the specificity of the animal to obtain positive results. With even approximate species there is no development of tumor. The first passage was made by subcutaneous injection in ten white rats but only four developed subcutaneous tumor. The animals died from the forty-second to the fifty-fourth day. In the later transmissions the tumor increases more rapidly and is more virulent. There is a greater percentage of positive results, 55 per cent of inoculations, and the animals die more rapidly. The histology of the tumors produced in the later passages while preserving the general characteristics, also shows a tendency to purification of the mixed type of the primary tumor.

W. A. BRENNAN.

Lehman, E. P.: Neuroblastoma; Report of a Case. *J. Med. Research*, 1917, xxxvi, 309.

The author first speaks of those primary tumors of the adrenal capsule, whose origin is ascribed to the nervous elements of the sympathetic system, and which form a group that, both on account of their rarity and on account of the histogenetic problems involved, has furnished an interesting chapter in the literature of pathology. In view of the small number of cases on which the recognition of this class of

neoplasms is based, he believes the report of another typical instance is of value; and to that end he has made this contribution.

According to the generally accepted opinion, these tumors arise from certain embryonic cells of the neuro-ectodermal system. These cells migrate ventrally in early foetal life from the anlage of the spinal cord to form the sympathetic chains and their paraganglia. The penetration of numbers of these cells into the already formed cortex of the adrenal gives origin to the medulla of that organ, and in this stage of development the cells are of undifferentiated but characteristic type, the sympathetic neuroblast. Later, in the adrenal and the other paraganglia, the differentiation into chromaffin cells and ganglion cells takes place. The cells of the highly malignant sympathetic neuroblastoma correspond to the cells in the neuroblastic stage. The cells of the paraganglioma and ganglioneuroma correspond to the differentiated forms. The former, the author states, is the chromaffin-cell tumor, and the latter, the ganglion-cell tumor. The histogenetic relationship of these three neoplasms is now established, largely by the recent recognition of groups of undifferentiated cells in tumors of mature type, and of mature cells in tumors of embryonic type. Neuroblastoma and ganglioneuroma, he believes, therefore, represent the two extremes of a process of differentiation which he considers as taking place, in some instances at least, in the course of growth of an individual tumor. In other instances he thinks the degree of differentiation of the tumor may be the result of its origin at a particular stage of normal development of the sympathetic. These tumors, he states, may occur wherever the nervous elements of the sympathetic system occur.

It must be remembered, furthermore, the author says, that these tumors are related to the corresponding tumors of the central nervous system through the parent cell of the whole group, namely, the embryonic neurocyte of the neuro-ectodermal system before even that grade of differentiation has been reached which entails the migration of the sympathetic neuroblast. From these cells of the central nervous system are derived the neurocytoma of Marchand (embryonic), and the true neuroma of Virchow (mature), he states. The glioma, he believes, represents the product of another specialization of this parent cell.

Lehman reports the case of a child 11 months old with a large abdominal tumor which was successfully operated upon and which was diagnosed preoperatively as cystic kidney. Histological examination of the tumor proved it to be a neuroblastoma, and the author was able to demonstrate adrenal cortical cells in the capsule of the tumor. He states that this case was distinctive among undifferentiated tumors in one respect that deserves mention. It was the first case successfully operated upon. Although theoretically the feeling that evidence of metastasis may occur cannot be avoided, yet two and one-half months after operation the

child's health continued to improve. All other cases that had come to operation had died during or shortly after the operative procedure. He also reports twenty-five cases from the literature.

GEORGE E. BEILBY.

Judd, C. C. W.: The Diagnosis of Melanoma (Melanotic Sarcoma) by Means of the Resultant Effusions. *Am. J. M. Sc.*, 1917, clii, 717.

The author reports two cases of melanotic sarcoma, diagnosed by means of the fluid obtained by paracentesis. The new-growth in the first case involved the hilus of the lung, diagnosis verified at autopsy, while in the second some abdominal structure was affected. In neither case did the clinical history or physical examination, aside from the study of the effusions, aid in determining the diagnosis, the first case in fact had been sent to a sanitarium for tuberculosis. The fluid obtained by paracentesis, chest and abdomen, was coffee-colored, quite opaque, appearing not unlike crude petroleum, with a deceptive play of iridescence. The test for melanogen was negative, but melanin was readily demonstrated. Bile tests were negative. Microscopically not only red blood-cells, epithelial cells, and leucocytes were found, but also many tumor-cells, which, unstained, showed the typical pigment granules of melanoma.

R. B. BETTMAN.

SERA, VACCINES, AND FERMENTS

Caulfield, A. H.: Preliminary Report upon New Methods for the Production of Antistreptococcal Sera. *J. Pathol. Bacteriol.*, 1916, xxi, 28.

The present investigation was begun by Caulfield shortly after Sir A. E. Wright's address on wound infections was published (1915), and the considerations then presented upon the rôle of the digestive action of the leucocytes prompted him to inquire what effect the character of the exudate itself might exert upon the inoculated virulent streptococci both within the exudate and *in vitro*.

Monkeys were used for the experiments. A right-sided intrapleural injection of 0.75 ccm. of turpentine was made in each of two monkeys, and on the following day an intrapleural injection of 20 ccm. of aleuronat suspension in each of two other animals. On the third day following the turpentine inoculation doses of virulent streptococcus pyogenes were intrapleurally inoculated into each of the two pairs of monkeys, and also into each of a pair of normal untreated monkeys.

Of the three animals receiving the smaller dose of streptococci the normal and the aleuronat animals showed during the first four days slight irregular fever up to about 104° F. All the animals which had received the greater dose of streptococci exhibited for three days a high fever, which thereafter, in the case of the turpentine-injected monkey, slowly and irregularly subsided. The remaining two ran approximately similar temperatures, the normal

animal appearing to be in poorer condition. All the animals were killed on the eighth day, at which time the only animal which looked ill was the normal monkey which had received the larger dose of cocci, and the following results were obtained on autopsy:

1. In the turpentine-injected monkeys, both animals showed in the right side heavy gelatinous deposits of fibrin on both pleural surfaces, with adhesions here and there and intervening pockets of clear amber fluid. Blood-cultures from both were negative, as were also cultures taken from different parts of the pleural surfaces and from several of the pockets of fluid.

2. In the aleuronat-injected monkeys, both monkeys showed fairly compact, apparently encapsulated masses of exudate in the lower part and alongside the spinal column of the right pleural cavity. Irregular areas of pulmonary consolidation of a leathery consistency, with thickened pleural deposit, were scattered especially over the lower lobes. Blood-cultures were negative in both animals. Of the several cultures made from different parts of the pleural space, two—taken from the monkey which had received the greater dose of streptococci—showed positive growth.

3. In the control monkeys which received only the streptococcus inoculations intrapleurally, the animal which had received the greater dose showed soft pleuritic adhesions and elsewhere a scattered fibrinous deposit. The underlying lung was generally consolidated for a varying distance underneath the pleura. Smears failed to show the streptococci, although all cultures from the pleura and lung were positive, as was also the blood-culture. The monkey which had received the smaller dose showed slight, if any, pathological changes of the pleural surfaces, and cultures from the blood and pleura were negative.

GEORGE E. BEILBY.

Kligler, I. J.: The Evolution and Relationship of the Great Groups of Bacteria. *J. Bacteriol.*, 1917, ii, 165.

It is a difficult feat of the imagination, in the author's opinion, to reconstruct the path of evolution of any group of organisms, especially that of the bacteria. In all cases certain difficulties are encountered; but, whereas among the higher organisms one is troubled by the lack of transitional types, the main difficulty among bacteria seems to him to lie in the superabundance of intermediate strains. Moreover, while among the former gross structural distinctions are the chief guides, among the latter one has to rely to a great extent on the finer biochemical and metabolic differences, he says. Yet he believes that an attempt to trace the evolution of these simple cells may well lead to a clearer conception of the character of the organisms and the nature of their adaptation to a saprophytic, parasitic, or pathogenic mode of life.

Although as he states it may be impossible to say with certainty when and how bacteria originated, the evidence, little as it is, seems to him to point to

these minute unicellular organisms as among the most primitive of living forms.

The author attempts to trace the probable lines of evolution of the different groups of bacteria and he presents a schematic outline to illustrate these various groups. While, as he states, it may be faulty and incomplete, still it seems to aid in showing the relationship of these organisms to one another as members of a single if diversified order.

GEORGE E. BEILBY.

Besemer, A. M.: A Study of Five Members (or So-called Species) of the Septicæmia Hæmorrhagica (Pasteurella) Group of Organisms with Special Reference to Their Action on the Various Carbohydrates. *J. Bacteriol.*, 1917, ii, 177.

The author notes that many species of animals are susceptible to the disease known as septicæmia hæmorrhagica or pasteurellosis. This disease has been reported in cattle, horses, reindeer, buffalo, fowls, rabbits, and pigs. When an organism was isolated from an animal infected with septicæmia hæmorrhagica, it was usually named according to the animals from which it was isolated, as bacterium bovisæpticum, bacterium avisæpticum, or bacterium renntierpasteurella. It is generally considered, the author states, that these organisms are similar in morphological characters and in many of their biological properties.

The object of the present work was to determine whether the members of this group could be differentiated by their cultural properties, especially by their biochemical action on the various carbohydrates. As the investigation was limited to a study of biochemical characters, the summary of the literature mentioned only those works which had taken up these characters in detail.

The methods used in the investigation here reported were as follows: The acid fermentation of the different carbohydrates was determined in media prepared from sugar-free meat infusion bouillon with the reaction adjusted to about +0.3, Fuller's scale. To this sugar-free bouillon 1 per cent of the various carbohydrates was added. An increase in acidity was very marked in some of the carbohydrate bouillons after sterilization.

The results of Besemer's work showed some discrepancies with the findings of previous investigators. These variations, he believes, may be accounted for by differences in technique or by slight variations in the cultures caused possibly by different methods of culturing.

The author considers that the most striking feature brought out by the study of these organisms was that there is a much greater uniformity between the members of this group in their biochemical properties than has been noted in the study of some other groups of bacteria. There seemed, he says, to be no biochemical basis for designating by different names the five members of this group which were studied.

In conclusion, he states that the members of the

septicæmia hæmorrhagica group studied were practically uniform in their biochemical actions, and the passing of an organism through a rabbit did not change its biochemical characters, except to a very slight degree.

GEORGE E. BEILBY.

BLOOD

Mueller, G. P.: Blood-Pressure from the Standpoint of the Surgeon. *Med. Rec.*, 1917, xci, 803.

The importance of blood-pressure estimations in surgical cases may be summarized as follows:

1. The anticipation of possible complications, such as hypertension and hypotension.

2. In recognizing shock and controlling its treatment. Here the estimation of the blood-pressure is invaluable.

In cases of traumatic injury the physician should at once estimate the diastolic pressure, and if it is below 80 mm. treatment should be instituted at once. Shock practically exists if the diastolic pressure falls to 60 mm. or less. Immediate placing of the patient in the inclined head-down position, intravenous injection of saline solution, and the application of heat should be instituted until the diastolic pressure rises and approaches 80 mm. Then and then only should operations be done. Too often the patient is hurried around from receiving ward to operating room and operated on while still in shock.

EDWARD L. CORNELL.

Faught, F. A.: Blood-Pressure Formulas, Their Value and Significance. *Med. Rec.*, 1917, xci, 796.

Among the newer methods of precision, sphygmomanometry has withstood the test of time and has rightly been accorded an important position among the diagnostic methods of clinical medicine.

Repeated observations should be the rule, not only in those cases presenting such evident departures from normal that there is little or no question as to the findings themselves or of their significance, but also in those borderline cases and in the many unstudied conditions where careful observations may deduce valuable information. Single observations are notoriously misleading, and, standing alone, should rarely be relied upon. Serial observations and the general average of blood-pressure values are more reliable.

Another point of primary importance in the practical employment of this test is to see to it that blood-pressure records alone do not have too great value attached to them. The study of the blood-pressure should be most carefully correlated to all available evidence.

Another important matter for consideration is that of the method of making the observations. At the present time only the auscultatory method should be considered, unless it be the graphic, which is rarely practicable for the clinician.

It is unfortunate that it has not yet been determined whether the fourth or fifth point, that is the beginning or ending of the fourth phase, should

be taken as the diastolic point, so that actually we are as yet unable to completely synchronize our several observations. Owing to the difficulty occasionally encountered in determining the length of the fourth phase, it would seem advisable, for the present, at least, to adopt the fifth point, or the complete disappearance of sound, as the diastolic point. If the fifth point is assumed to indicate the diastolic pressure, it becomes necessary to make an exception of cases of aortic insufficiency and adopt the fourth point, as in these cases audible sound persists even when the indicator reaches zero.

It is now conceded that the normal ratio between systolic, diastolic, and pulse pressure is as 3: 2: 1. In cases of hypertension, acute nephritis, aortic insufficiency, decompensated mitral disease, and chronic uræmia this ratio is always disturbed.

Concerning the relation of the phthalein output to the height of systolic blood-pressure and to the size of the pulse-pressure, there has not yet been established any definite relation between the findings of these two methods, and it seems doubtful if any great benefit can be derived from efforts to correlate these two tests.

Careful study of Stone's formula, together with its application to average readings obtained in a large series of cases, has proved that the premises assumed by him and his imitators are false and, therefore, that their conclusions are untrustworthy.

The conclusions reached are:

1. Blood-pressure observations, to be of value, must be accurately made and recorded; and averages based upon a series of observations are of more value than isolated blood-pressure tests.
2. The systolic blood-pressure alone is of far less clinical value than when considered in relation to diastolic pressure, the pulse-pressure, and the pulse-rate.
3. Formulæ for the determination of cardiac load and overload, based upon the diastolic pressure and pulse-pressure, should be employed with great caution, as it is probable that they do not give the information ascribed to them.
4. Cardiac energy, load and overload, are probably clinically best indicated in sphygmomanometry by the systolic pressure alone, although it may be profoundly modified by the pulse-rate.
5. Marked departure from the normal systolic, diastolic pulse-pressure ratio is usually an indication of an abnormal state of the circulation.
6. The maintenance of 3: 2: 1 (S. D. P.) ratios, even with markedly elevated systolic pressure, usually indicates an efficient circulation.
7. Diastolic pressure is our best indication as to the state of peripheral resistance, and is of value in toxæmic, hypertensive, and arteriosclerotic conditions. The value of high systolic pressure and large pulse-pressure findings are greatly increased by careful urinary examinations, as the degree of kidney involvement is usually of more importance in prognosis than the actual height of systolic pressure.

8. A small pulse-pressure in high-pressure cases is suggestive of myocardial involvement, and this indication becomes more serious as the cardiac rhythm becomes altered.

9. The pulse-pressure is of considerable value in determining circulatory efficiency and also in indicating the cardiac output. Its significance, however, may be greatly modified by the degenerative changes in the arteries and by the pulse-rate.

EDWARD L. CORNELL.

Weil, P. E.: The Coagulability of the Blood in Surgery (De la coagulation du sang en chirurgie). *Presse méd.*, 1917, p. 209.

Weil discusses the importance of the surgeon knowing the coagulation power of the blood owing to the complications which may arise in surgical operations, such as hæmorrhage and thrombosis.

In addition to the clinical examination of the patient the actual power of the coagulability of the blood may be studied by Block's method which is less complicated than others. In carrying out this test 1 ccm. of blood is drawn from a vein into an isotonic solution composed of sodium citrate 1 gm.; sodium chloride 7 gm.; distilled water 400 ccm. A series of five test-tubes each containing about 3 to 4 ccm. of isotonic sea salt solution are prepared and to each is added a 5 per cent solution of calcium chloride in amounts of 0.1 ccm., 0.2 ccm., and so on up to 0.5 ccm. for the fifth tube. Then 2 ccm. of the citrated blood is added to each tube. In from 12 to 15 hours the coagulation process is complete. The citrate prevents the blood from coagulating by inactivating the calcium in the blood; the calcium restores the coagulating power; and this power is calculated by estimating the ratio between the amounts of calcium and citrate in the different tubes. Each tube, including one without chloride of calcium, is numbered and they form a coagulation index according to a scale devised by the author. Normal, excessive, or insufficient power of coagulability is shown by the degree of coagulation in the tubes.

When the test-tubes show insufficient or excessive coagulability the author advises as follows: For insufficient coagulability in acquired hæmophilia, the subcutaneous injection of from 20 to 40 ccm. of blood serum corrects the abnormal condition and provides against postoperative hæmorrhage twenty-four hours after injection. But if the patient comes from a family of bleeders it is necessary to undertake such injections many months before operation, repeating the injection every two months for about a year.

In patients with a hæmorrhagic diathesis more liable to occur spontaneously than with hæmophilia, the author habitually makes a subcutaneous injection of 20 to 30 ccm. of human blood forty-eight hours before operating. Such injected blood usually supplies hæmatoblasts which are lacking in the patient.

For excessive coagulability where thrombosis is

liable to occur, the blood can be rendered less coagulable by citric acid. It is given in daily doses of 12 to 18 gm. Weil adds that sodium citrate in similar doses or subcutaneous injections of saline or glucosed isotonic solutions might be used.

W. A. BRENNAN.

Taylor, J.: Secondary Hæmorrhage. *Practitioner*, Lond., 1917, xcvi, 413.

The author reports a few of the more serious cases of secondary hæmorrhage that came under his observation as emergency surgeon in one of the military hospitals.

Secondary hæmorrhage is most common in the presence of sepsis. Where possible, the wound was opened and the bleeding controlled at the bleeding point. This mode of treatment was impossible in many or most of the cases due to swelling and infiltration disturbing relations, etc., leaving the tissues so friable that they would not hold instruments or ligatures. Proximal ligature or amputation had to be resorted to.

Of all secondary hæmorrhages, those occurring in compound fractures of the thigh were the most serious.

Hæmorrhage in arm wounds was much less serious, even in the face of sepsis; the brachial and axillary arteries could be ligated without serious effect.

Gunshot fractures of the jaw were a fertile source of secondary hæmorrhage; many of these were slight and could be controlled by cold water syringing; when they recurred again and again, ligation of the external carotid was done.

One case reported had six recurrent bleedings, definite measures being taken each time to arrest it.

It was the opinion of several of the medical officers that secondary bleeding seemed to be more frequent in cases in which eusol was used.

LUCIAN H. LANDRY.

Bernheim, B. M.: The Limits of Bleeding Considered from the Clinical Standpoint. *Am. J. M. Sc.*, 1917, cliii, 575.

The author urges that henceforth transfusion of blood be not regarded entirely as a measure of last resort. A more thoughtful attitude concerning blood loss from any cause is greatly to be desired, and the phenomena accompanying bleedings of all magnitudes should be carefully noted and studied, with a view to improving the general knowledge of such matters. Furthermore, a partial revision of the existing ideas of combating hæmorrhage and the condition commonly known as shock may possibly be of material advantage in view of the fact that transfusion may be done so readily at the present time. But above all, surgeons and physicians should learn to recognize the limits of bleeding and to act promptly. In the acute hæmorrhages, according to Bernheim's experience, the safest guide is the blood-pressure; in the chronic bleedings and the anæmias it is the hæmoglobin; but one

must never lose sight of the fact that at times all signs fail, and there remains naught for guidance but experience and judgment. Under these circumstances the author's advice is, "When in doubt, transfuse!"

P. G. SKILLERN, JR.

Stansfeld, A. E.: The Principles of the Transfusion of Blood. *Lancet*, Lond., 1917, cxcii, 488.

Blood-transfusion has during the last decade become established on a sound experimental and clinical basis; but blood therapy is still in its infancy. It could not be properly tested until an elaborate technique had been perfected and certain accidents liable to result from admixture of certain bloods had been excluded.

The most obvious application is in the treatment of anæmias. The fact that an increased activity of bone-marrow frequently follows transfusion is demonstrated by the fact that the blood count usually rises with the simultaneous increase in reticulated red cells. In those cases in which excessive hæmolysis is known to occur it is difficult to determine how far improvement following transfusion is due to increased cell production and how far it may be due to diminished hæmolysis. That the latter is one of the factors concerned is indicated by the history of spontaneous remissions. The output of urobilin which is an index to blood destruction also corresponds to the remissions in the relapse of the disease. Remission following transfusion in pernicious anæmia has also been accompanied by diminished output of urobilin. Of 9 cases of pernicious anæmia in the author's experience, 4 showed very marked, and 3 less marked but definite improvement.

The donor should be a healthy adult whose blood is compatible with that of the patient. Infants may be transfused from their own mothers without performance of the usual tests. That the test is otherwise necessary is evidenced by the fact that in 800 reported cases of transfusions there were 15 instances of macroscopic hæmolysis. Among these there were 4 deaths.

Rigor occurs in about 10 per cent and fever in 25 per cent of the cases following transfusion of compatible bloods. Small amounts of blood will suffice to arrest spontaneous bleeding but in acute anæmia following hæmorrhage it should as far as possible replace the blood lost. Small repeated doses seem most beneficial in pernicious anæmia. The indirect sodium citrate method of transfusion is simple and involves no special danger.

POISONS

MacConkey, A. T., and Homer, A.: The Passive Immunity Conferred by a Prophylactic Dose of Antitetanic Serum. *Lancet*, Lond., 1917, cxcii, 259.

The occurrence of cases of tetanus even though a prophylactic injection of serum has been given draws attention to the comparatively short duration of the

complete passive immunity conferred by a dose of antitoxin. It has been stated that after a subcutaneous injection of antitoxin the antitoxin content of the blood reaches its maximum in two to three days and then remains fairly constant till about the seventh day, when it begins to decrease. It is also said that a sufficient dose of antitoxin gives complete protection for several days and partial protection for two to three weeks. The object of the author's communication is to record some experiments which bear on this point. These experiments form part of a larger series which was undertaken with the object of ascertaining the most economic, and at the same time reliable, method of using tetanus antitoxin.

The results of experiments by the authors are shown in seven tables. In considering these results two points stand out prominently. The one is the extreme differences in the susceptibility of guinea pigs to tetanus toxin; the other is the enormous doses which apparently must be given when passive immunity of long duration is desired. Of course, it would, under the present circumstances, be quite impracticable to use for man doses corresponding to some of those given to guinea pigs, and smaller doses must be used, even though the protection does not last as long as desired.

It is necessary to decide upon what is the best thing to do, knowing that one cannot count upon producing an immunity of long duration by the use of a single prophylactic dose of tetanus antitoxin. There are two ways of dealing with this question. On the one hand, one may, after giving the prophylactic dose, simply keep very careful watch for the first sign of incipient tetanus and then at once treat the case energetically. The authors have not noticed in the literature any suggestion that this course should be followed, though it is possible that as knowledge of the disease and its early symptoms increases, it may prove to be after all the best practice. On the other hand, one may repeat the protective dose with the object of keeping up the immunity. The latter view is largely favored by reason of experience gained since the war began.

P. G. SKILLERN, JR.

Du Bouchet, C. W.: Results Obtained in Tetanus by Intravenous Injections of Persulphate of Soda Combined with Antitetanic Serum (Résultats obtenus dans le tétanos par les injections intra-veineuses de persulfate de soude combinées au sérum antitétanique). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 924.

From the beginning of the war till March, 1916, all tetanus patients in the author's care were treated by subcutaneous, intravenous, or intraspinal injections of antitetanic serum, with or without addition of medicaments (morphine, bromine, etc). Results have been discouraging; and the author has been led to try the effect of persulphate of soda as recommended by Lumière. In a series of seven cases since March, 1917, in which this treatment

has been tried all recovered. The author is strongly impressed by this favorable series, which is very unusual, as well as by the striking immediate effect of the injection in causing subsidence of the tetanic convulsions.

The treatment consists in injecting in a vein once or twice a day, according to the gravity of the case, 20 ccm. of a pure and neutral 5 per cent solution of persulphate of soda. This is continued for eight to fifteen days, the frequency being regulated by the progress of the spasmodic symptoms. The persulphate should be kept dry and in the solid state. Solutions should not be kept for more than a few days as heat decomposes them. It is best to prepare solutions as required. There may be vomiting in some cases shortly after injection.

W. A. BRENNAN.

Lumière, A.: Postserum Tetanus (Sur les tétanos post-sériques). *Ann. de l'Inst. Pasteur, Par.*, 1917, xxxi, 19.

In a recent issue of the above journal Montais stated that the classical form of tetanus observed in the early part of the war was becoming less and less frequent according as preventive serotherapy is more regularly and more methodically applied. He noted that the immunity conferred by anti-tetanic serum was not absolute and only exerted its maximum efficacy for several days. He gathered accounts of 21 observations of post-serum tetanus without trismus.

Lumière has had the opportunity of studying the majority of cases of tetanus evacuated to the hospitals in Lyons and he has been enabled to collect 54 cases of postserum tetanus there. He gives the details of these cases in a tabular statement and from their study he deduces a number of conclusions regarding the pathogenesis and symptomatology of this particular form of tetanus. The series is divided into three categories based on the absence, slight occurrence, or presence of the principal symptom met in the classic type, viz., trismus.

In these 54 cases all of which had had preventive injections there was complete absence of trismus in 15; slight or very later appearance of trismus in 13; and in 26 the symptom was present with an intensity equal to the classic type.

Lumière draws the following general conclusions:

1. Preventive injections of antitetanic serum are not absolutely prophylactic.

2. The duration of immunity is not definite and depends on the relative proportion of toxins and of preventive serum in conflict in the organism.

3. Post-serum tetanus appears to be due to two principal causes: (a) superabundant secretion of toxin about the wound out of proportion to the dose of injected serum (early postserum tetanus); (b) liberation of tetanus spores up to then latent in the tissues by a secondary surgical intervention or a traumatism which prevents the activity of the antitoxin (late postserum tetanus).

4. Early postserum tetanus can, in the majority of cases, be avoided by opening up infected wounds, by careful removal of foreign bodies, by wide drainage, and by repeated injections of serum.

5. Late postserum tetanus is equally avoidable in more than half of the cases by injecting a fresh dose of serum when making a secondary intervention.

6. Preventive serotherapy always gives particular characteristics to postserum tetanus by more or less change in the symptomatology and clinical picture of the disease.

7. In a certain number (15 of the 54 cases observed) the injected antitoxin has prevented the fixation of the microbial poison in the central nervous system and limited its action to the motor nerves. These cases of localized tetanus without trismus are much less grave than other forms.

8. In other cases (13 of the 54) the bulbomedullary centers are only partly protected and there is a late or incomplete trismus accompanying the local contraction. The prognosis is less favorable.

9. When the antitoxin has not preserved the central nervous system the postserum form is observed with the original trismus. This is the most frequent (26 cases out of 54) and the prognosis is very grave.

10. The treatment of postserum tetanus calls for the administration of large doses of serum as early as possible. No curative treatment has so far been discovered, and the indication is to fight the symptomatic manifestations. Nothing can be done against permanent contracture but paroxysmal spasms can be treated with chloral or morphine or injections of sulphate of magnesia or persulphate of soda. The last seems to be the medicament of choice, owing to its efficacy and its weak toxicity.

W. A. BRENNAN.

Speed, K.: Tetanus Following Prophylactic Antitetic Injection. *Med. & Surg.*, 1917, 1, 14.

The author had charge of a base hospital in France and during the year 1916 supervised the care of approximately 12,000 wounded men.

A wounded soldier is given as a routine a prophylactic injection of 500 units of antitetanic serum. In spite of this injection, out of the 12,000 cases mentioned, there were six cases of tetanus, with 50 per cent mortality, which is a very small percentage for such a large number of wounded. The treatment instituted was injection of large doses of antitetanic serum, subcutaneously, intrathecally, and intraspinously.

J. H. SKILES.

Gross, G.: One Hundred Thirty-four Cases of Gaseous Gangrene (A propos de 134 cas de gangrene gazeuse). *Bull. et. mém. Soc. de chir. de Par.*, 1917, xliii, 636.

From March to December, 1916, the author observed 134 cases of gas gangrene amongst 4,472 wounded. Clinically there are three types: (1) a local attenuated type which often cures, but often evolves into gaseous gangrene; (2) a diffuse toxic

form, which frequently calls for amputation. (3) Between these two extreme types there is a middle type more or less diffuse which yields either to multiple incisions or amputation.

Of the 134 cases, 117 were shell wounds, 10 due to grenades, 3 to shrapnel, and 4 to rifle bullets. Fifteen of the cases were in the upper and 119 in the lower limb. The large vessels were injured in 46 of the cases.

Of the 134 cases there were 57 recoveries and 77 deaths. Of the 57 recoveries 46 were after amputation or disarticulation and 11 after wide stripping and ether lavage. Of the 77 deaths, 51 were after amputation or disarticulation and 26 after multiple openings. The upper limb cases gave 53 per cent recoveries and 46 per cent deaths. The lower limb gave 41 per cent recoveries and 59 per cent deaths.

The time elapsing between injury and operation is very important in the development of gas gangrene. This is known in 129 of the 134 cases:

	Per cent.
Of those operated within 12 hours.....	14 died—10.86
Of those operated from 12 to 24 hours.....	24 died—18.60
Of those operated from 24 to 36 hours.....	10 died—7.75
Of those after 36 hours.....	38 died—29.25

W. A. BRENNAN.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Pearson, W.: Important Principles in the Drainage and Treatment of Wounds. *Lancet*, Lond., 1917, cxcci, 445.

The author bases his opinions on personal observation and practice of war surgery extending over a period of more than two years. Adequate drainage is considered the one absolute essential to good results. Those who pin their faith to antiseptics such as the hypochlorites, by means of which they believe they can diminish or destroy the organisms *in situ* admit that their drainage is faulty and ineffective in that they are unable to obtain satisfactory results by drainage alone. The large number of antiseptics in vogue is in itself evidence of the limitations of this treatment. The good results obtained by the concentrated saline treatment are due to the adequate drainage which Sir Almroth Wright has emphasized as essential. The belief is expressed that while it is generally recognized that sepsis cannot be adequately dealt with by antiseptics or concentrated salines if unsupported by drainage, it is not generally recognized that wound infection can be thoroughly and efficiently controlled by mechanical drainage alone. What is sufficient drainage in the common infections of civil practice is usually totally inadequate when dealing with military wounds of similar magnitude. The difference possibly is due to the large number of anaerobes present in military wound infections.

The chief factors governing the efficacy of drainage are free incision and loose drainage, counter

incision for gravity drainage and capillary drainage secured by light packs to all parts of a wound and exposure to air to allow for evaporation. Drainage tubes should be used where dead space cannot be obviated by gauze packing or where dead tissue is present which it is inadvisable to remove. Large quantities of fluids by mouth also tend to promote free discharge.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

McClure, C. W., Vincent, B., and Pratt, J. H.: **The Absorption of Fat in Partially, and in Completely Depancreatized Dogs.** *J. Exp. Med.*, 1917, xxv, 381.

The first part of the present study deals with the absorption of fat in dogs with subcutaneous transplants of the pancreas which discharge their secretion externally. In the second part the results of experiments on completely depancreatized dogs are presented.

Ether anæsthesia was used in all the operations. Before etherization a subcutaneous injection of morphine was given. The processus lienalis and corpus pancreatis were completely extirpated, and great care was taken to remove from the duodenal wall every bit of adherent pancreatic tissue. The processus uncinatus of the pancreas was then freed from all its attachments except where the blood-vessels entered at the lower end. Leaving these vessels intact, the major portion of the processus uncinatus was transplanted under the skin of the abdominal wall.

The metabolism in a completely depancreatized dog with the resulting diabetes was greatly disturbed. Animals after total pancreatectomy usually remained in suitable condition for experimentation but a short time. Because of this, it was necessary to work rapidly and without regard for certain factors which interfered somewhat with the accuracy of the results. Experiments were begun the day following the operation without regard to any possible postoperative effect upon absorption. No attempt was made to make the amounts fed uniform. The appetites of the dogs were often capricious. In order to make certain of as large a food intake as possible during an experiment, the animals were given at a feeding as much food as would be taken.

Metabolism experiments were done on four partially depancreatized dogs with subcutaneous transplants, which discharged the pancreatic juice externally. The animals were free to lick their fistulae and thus ingest pancreatic juice. How much pancreatic secretion was obtained in this way could not be determined.

After partial depancreatization one dog absorbed 75.2 per cent of the fat ingested, while 45.3 per cent was absorbed after complete pancreatectomy. Results almost identical to these were obtained in the first and second metabolism experiments on another of the dogs, although the transplant was

still secreting in the second experiment. The only difference was that the dog obtained no secretion, as it was muzzled. The first dog absorbed a larger percentage of fat when completely depancreatized than did the second which possessed functioning pancreatic tissue. The authors found that it was possible for a completely depancreatized dog to absorb as much fat per kilo of body weight as when the same dog possessed functioning pancreatic tissue which did not secrete into the intestines, and that dogs with a subcutaneous transplant secreting and discharging pancreatic juice externally absorbed no more fat than dogs in which the pancreatic remnant was undergoing rapid atrophy and sclerosis. Hence, they state, the condition of the pancreatic tissue remaining in the body did not influence the amount of fat absorbed by the intestine.

The absorption of fat by the intestinal mucous membrane was always markedly disturbed when the pancreatic secretion was excluded from the intestine.

After the complete removal of all pancreatic tissue from an animal, the absorption of considerable amounts of fat can still take place, the authors conclude.

GEORGE E. BEILBY.

Taylor, H. D., and Murphy, J. B.: **Experiments on the Rôle of Lymphoid Tissue in the Resistance to Experimental Tuberculosis in Mice; Effect of Cancer Immunity on Resistance to Tuberculosis.** *J. Exp. Med.*, 1917, xxv, 609.

An investigation recently reported from the Rockefeller Institute seemed to the authors to bear out the conception that the lymphocyte plays a part in the resistance of the animal to tuberculous infection. This work had for its starting point the observation of Lewis and Margot that mice experimentally infected with bovine tubercle bacilli developed splenic enlargement. Lewis and Margot also showed that animals splenectomized about three weeks before the injection of the tubercle bacilli exhibited greater resistance to the infection than did intact animals. In a study in the Institute of blood changes after splenectomy, it was observed that the majority of mice so treated developed a marked lymphocytosis by the nineteenth to the twenty-first day after the operation. It was thought probable, therefore, that this lymphocytosis might be a factor in causing the greater resistance displayed by the splenectomized animals.

The following experiments confirmed this view: Mice splenectomized and then exposed to repeated small doses of X-ray, which had been demonstrated to affect primarily the lymphoid organs, proved to be more susceptible instead of more resistant to infection than were either normal animals or animals splenectomized alone. Intact X-rayed mice were likewise highly susceptible to infection with the bovine tubercle bacilli. As the authors state, Morton has observed also that the X-rayed guinea pig is more susceptible to infection with the human type of the tubercle bacillus than is the normal animal.

The experiments reported were not undertaken by the authors with the idea of establishing a relationship between cancer and tuberculosis, as they know of no sufficient reason to assume the existence of such a relationship. However, they state, it has long been believed that some such specific antagonism between the two conditions exists. But considering that the ages at which cancer and tuberculosis reach their highest incidence are widely divergent, and that cancer rarely, if ever, attacks a debilitated individual, this idea of a specific antagonism would seem to the authors to have little basis in fact. That the two diseases may occur simultaneously in the same individual is borne out by many reports which have been made in recent years.

Mice so X-rayed as greatly to reduce the lymphoid tissue, the authors found, are rendered highly susceptible to tuberculous infection. On the other hand, they state, when a marked lymphocytosis is induced by first immunizing mice against, and then inoculating them with cancer, the resistance to tuberculous infection is greatly enhanced. This heightened resistance, they believe, may be set aside and even changed to a state of increased susceptibility to the infection by again depleting the lymphocytes by means of the X-ray.

GEORGE E. BEILBY.

Manley, O. T., and Marine, D.: The Transplantation of Splenic Tissue into the Subcutaneous Fascia of the Abdomen in Rabbits. *J. Exp. Med.*, 1917, xxv, 619.

This study was undertaken by the authors to determine whether or not the malpighian bodies, the pulp cells, and the sinuses are separate tissues with separate functions, or more interrelated functionally and morphologically than their anatomical appearances indicate. It occurred to them that transplantation, if this were possible, would throw some light on the subject of regeneration and possibly on the relative value of the tissues in this reaction. They were unable to find any record of the transplantation of splenic tissue where the grafts were studied from this viewpoint or from the standpoint of the growth and permanence of the grafts. They therefore report the end-results of a series of transplantations made more than a year ago. Twelve attempts at homotransplantation and six attempts at autotransplantation were made on fifteen rabbits.

The authors state that they did not find in the literature a report of an instance of permanent homo- or autotransplantation of the spleen or of the probably closely related spleno- and hæmolymp glands. Spleen autotransplants with considerable difficulty, they state, as compared with thyroid, parathyroid, ovary, or adrenal cortex. This, they assume, may be due to its complex anatomical structure. One instance of a permanent autotransplant was observed. None of their attempts to homotransplant it were successful beyond the

usual taking and persistence for two or three weeks, common to all homografts. The successful permanent subcutaneous autotransplantation, they state, had all the morphological characteristics of a fully differentiated and functionally active spleen. This method of transplantation seemed to the authors to offer a means of learning more of the normal development, regeneration, and function of this complex tissue. GEORGE E. BEILBY.

Pappenheimer, A. M.: Experimental Studies upon Lymphocytes; the Reactions of Lymphocytes Under Various Experimental Conditions. *J. Exp. Med.*, 1917, xxv, 633.

A simple method is presented in this study by which, with the diffusion of trypan blue into the nucleus as a criterion of cell injury, it is possible to study quantitatively the effect of various agencies upon the small thymus cells and upon the tissue lymphocytes. Preliminary studies with this method have led the author to the following conclusions, which, however, unless otherwise stated, may be taken, they say, as applying only to the lymphocytes of the rat thymus.

1. The small thymus cells, when suspended in balanced phosphate solutions, showed no distinct reaction to variations in hydrogen ion concentrations ranging between P_H 7.0 and P_H 7.8. Beyond P_H 7.0 there was a sudden increase in the permeability of the cells to the dye; plasmolysis of the cells occurred when the alkalinity exceeded P_H 8.0.

2. Heating to 49° or 50° C. was accompanied by a critical increase in the permeability of the cells to the dye.

3. The injury caused by lack of oxygen can be demonstrated, the author states, by the increase in the number of stained cells.

4. The addition of serum to suspensions of thymus cells or tonsil lymphocytes greatly inhibited the diffusion of the trypan into the cells. The protection afforded was roughly proportionate to the amount of serum added.

5. Gelatin also exerted a marked protective influence; egg albumin afforded a partial protection; starch and gum arabic were inert. Hæmoglobin and cholesterol did not modify the stainability of the cells.

6. Arsenious sulfide in weak concentrations partially inhibited the diffusion of the dye. Colloidal iron was without effect, and was precipitated about the cells.

7. The toxicity of the photodynamic substance, hæmatoporphyrin, and of an impure chlorophyll solution in the presence of sunlight was strikingly demonstrated by the greatly increased permeability of the cells to the stain.

8. Acute and chronic inanition produced an increased fragility of the cells. The protective power of the serum in acute starvation appeared to be increased.

9. The small thymus cells of old animals were more readily injured than those of young ones,

as was indicated by the increased proportion of stained cells.

The method was applied to the demonstration of the action of cytotoxic immune sera for rat thymus cells and for human tonsil lymphocytes *in vitro*. Further experiments dealing with the question of specificity are now in progress. The cytotoxins are inactivated by the addition of complement. Thermostable cytoglutinins were also produced.

GEORGE E. BEILBY.

Robertson, O. H., and Rous, P.: The Normal Fate of Erythrocytes; the Findings in Healthy Animals. *J. Exp. Med.*, 1917, xxv, 651.

The authors note that it has long been recognized that in the healthy body a considerable proportion of the erythrocytes are broken down and replaced every day — exactly what proportion is not known. The bile pigments have been deemed an indicator of the hæmoglobin destroyed. Calculations based upon their rate of formation would seem to show that blood destruction is very rapid, in man from one-tenth to one-fifteenth of all the corpuscles being lost and replaced in twenty-four hours. But, the authors state, the recent work of Whipple, who has proved that the bile pigments may have other sources than the blood, demonstrates a large possible error in such calculations, and perhaps the most certain evidence of blood destruction is to be found in the constant activity of the bone-marrow in the production of new cells.

The authors first take into consideration the view held by some investigators that phagocytosis is of itself sufficient to account for blood destruction and their investigations were carried on with the view of determining, for instance, what rôle the spleen plays in the destruction of red blood-cells. They examined sections of spleen of the guinea pig, dog, cat, rabbit, and monkey.

They then undertook a search for evidence of extracellular blood destruction. Cats were employed for these experiments. After positive findings had been obtained with them the observations were extended to other species.

From their study and observation the authors make the following summary:

The phagocytosis of red corpuscles, while frequent in the normal dog, rat, and guinea pig, was slight in man, the rhesus monkey, and many rabbits. In cats it was always negligible in amount and frequently absent. Phagocytosis did not suffice as a general explanation of normal blood destruction.

When the liver, spleen, and bone-marrow of the cat, dog, rabbit, or monkey were slowly perfused with defibrinated blood or Locke's solution, bodies were given off into the fluid which had the appearance of red corpuscles that had lost their hæmoglobin but retained the rest of their cell substance. These bodies possessed many of the properties supposedly distinctive of red corpuscles. They were the product of disordered parenchymal cells.

By a special method it was possible to search the

body, organ by organ, and the circulating blood also, for disintegrating red corpuscles. Shadows of red cells were not present anywhere, nor were hæmolyzing red cells found. A hæmolytic process, in the ordinary sense of the term, can scarcely play an important part in normal blood destruction, the authors declare. Instead, it is certain that some red corpuscles, at least, are destroyed in another way; namely, by fragmentation. Normal blood regularly contains small numbers of fragmentation forms — microcytes and pœcilocytes — and accumulations of them were regularly present in the spleen, but found only inconstantly in the other organs. The fragments were in evident process of further subdivision. They occurred not only in species in which phagocytosis as a means of cell destruction is negligible (cats) but also in animals in which it is an important process (dogs, some rabbits).

The method of study that the authors employed was well suited to disclose how the blood is destroyed. The importance of cell fragmentation in this connection was indicated to the authors by their failure to find any other means of destruction, save only the phagocytosis already known. Further facts indicating the importance of fragmentation are presented in a second paper by the authors, together with a general discussion.

GEORGE E. BEILBY.

Robertson, O. H., and Rous, P.: The Normal Fate of Erythrocytes; Blood Destruction in Plethoric Animals and in Animals with a Simple Anæmia. *J. Exp. Med.*, 1917, xxv, 665.

The findings presented in a preceding paper by the authors showed clearly that phagocytosis can account for red cell destruction only in certain species, and that whatever the extracellular method of this destruction may be, it does not entail the formation of shadows, such as result from hæmolysis. The evidence was against a direct hæmolytic action in the spleen. The constant presence in this organ of an accumulation of pœcilocytes which are subdividing, and of microcytes, and the presence of these elements in the circulating blood indicated that the red cells disappear, in part at least, by fragmentation.

In a further study of the methods of blood destruction, the authors examined rabbits rendered plethoric by repeated direct transfusion. Such animals soon acquired the ability to dispose of large quantities of blood. This went on in the absence of demonstrable agglutinins or hæmolysins, and according to certain authors it represents an intensification of the normal process of destruction, what that is the authors cited could not discover. They stated that the spleen is the only organ in which changes are regularly met with, that it is enlarged, and phagocytes containing red cells are more numerous than usual.

The circulating blood of many of the plethoric animals showed microcytes and pœcilocytes — schizocytes — in far greater numbers than did

that of normal controls, but no other signs of blood destruction were seen in it. Microcytes and pœilocytes were frequent in the blood of animals rendered anæmic by hæmorrhage. The conception that these forms are the result of blood destruction finds here, the authors state, an apparent contradiction; for in simple anæmia a conservation of blood would be expected rather than increased destruction. Their findings in this connection may be briefly summarized, the authors state. There was a striking increase in the spleen's content in microcytes and pœilocytes. Much of its residual blood consisted of these forms, and, in several instances, the organ was somewhat enlarged from their accumulation. Phagocytosis was not increased. In some of the other organs, especially in the kidney, small collections of microcytes and pœilocytes were inconstantly present.

The authors draw the following conclusions:

1. The increased destruction of red cells in animals rendered plethoric by transfusion takes place predominantly by a fragmentation of the corpuscles without loss of hæmoglobin.

2. The microcytes and pœilocytes observed in animals with a severe anæmia due to hæmorrhage are not put forth as such by the bone-marrow, but are portions of cells fragmented while circulating.

3. The cells thus fragmented are for the most part those new formed to meet the exigencies of the situation. Such cells are in large part unable to withstand the wear and tear of function. There results a vicious circle. The anæmia renders the bone-marrow unable to put forth proper cells, and those it does produce are soon destroyed, thus prolonging the condition. A similar state of affairs probably exists in many human anæmias.

4. The occurrence of large accumulations of microcytes and pœilocytes in the spleen of anæmic and plethoric animals indicates that the organ exercises some important function in connection with these forms. The same is true of normal animals, for the findings in them are similar, though less striking, the authors state.

5. The normal fate of the red corpuscles, in those species in which phagocytosis is negligible, is to be fragmented one by one, while still circulating, to a fine, hæmoglobin-containing dust. The cell fragments are rapidly removed from the blood, but their ultimate fate remains to be determined, the authors say. The facts indicate that they are removed from the blood by the spleen, and exceptionally, by the bone-marrow.

GEORGE E. BEILBY.

Goto, K.: A Study of the Acidosis, Blood Urea, and Plasma Chlorides in Uranium Nephritis in the Dog, and of the Protective Action of Sodium Bicarbonate. *J. Exp. Med.*, 1917, xxv, 693.

This investigation was undertaken to study the development of acidosis in nephritis produced by uranium nitrate and the relation of this acidosis to the changes in urea and chlorides of the blood, and also to study the effect of administration of sodium

bicarbonate upon all these factors. In these experiments the following determinations were made: (1) the carbon dioxide content of the plasma and the hydrogen ion concentration of the serum, (2) the urea nitrogen of the blood, (3) the chlorides of the plasma, and (4) the reaction of the urine and its content of albumin and casts.

The blood for these determinations, except for the hydrogen ion concentration of the serum, was obtained by drawing the blood from the external jugular vein through a tube passing to the bottom of a centrifuge tube containing either sodium oxalate or potassium oxalate crystals and a layer of paraffin oil which, floating on the surface of the blood, excluded contact with the air.

The author's investigations showed that the nephritis produced by means of uranium nitrate presented a diminution of the plasma carbon dioxide content, associated with an increase of blood urea and plasma chlorides and the appearance of albumin and casts in the urine. These changes indicated the presence of an acidosis in the nephritis produced by uranium nitrate.

Moreover, both the nephritis thus produced and the acidosis which accompanied it were diminished by means of sodium bicarbonate. In dogs receiving sodium bicarbonate and given uranium nephritis, there was maintained a higher plasma carbon dioxide content, a less pronounced increase of chlorides in the blood, as well as a diminution of albumin and casts in the urine as compared with animals given uranium nephritis and receiving no soda. In severe nephritis the amount of urea was also diminished in the carbonate dogs as compared with the controls. The nephritis of the carbonate dogs was less severe as regards the histological picture than that of the controls.

The presence of an acidosis in dogs with experimental uranium nephritis was demonstrable by the Van Slyke-Stillman-Cullen method and that of Marriott, and was detected more readily by the former method.

This acidosis was associated with increase in the blood urea and plasma chlorides and with the appearance of albumin and casts in the urine.

The oral administration of sodium bicarbonate diminished the acidosis, the increase in plasma chlorides, the amount of albumin and casts in the urine, and, to a lesser degree, the increase in the blood urea following the administration of uranium. It also diminished the severity of the changes produced by uranium in the kidneys.

The oral administration of sodium bicarbonate to normal dogs raised the carbon dioxide content of the plasma as determined by the Van-Slyke-Stillman-Cullen method.

GEORGE E. BEILBY.

Warren, J. H.: Observations on the Formation of Giant Cells in Tuberculosis. *J. Med. Research*, 1917, xxxvi, 225.

Warren calls attention to the views of various authors concerning the origin, function, and fate

of giant cells, and shows that as a result of the numerous investigations there have arisen several disputed points. He calls attention to the fact that certain authors believe that giant cells have their origin from fixed connective-tissue cells or epithelial cells, others, that they are of leucocytic origin, and second, that certain other observers believe that the giant cells are formed by a fusion of cells or that they arise by repeated division of the nucleus of a single cell without a division in its cytoplasm.

The author has made use of certain refinements in staining of tissues in order to throw some light upon this problem, particularly the silver impregnation method of Bielschowsky. The specificity of this method for reticular fibrils has apparently been well established. For instance, Ferguson, after a careful investigation of this method, came to the conclusion that excluding muscles, nerves, and embryonic mesenchyme it was specific for the reticulum of Mall, and Downey employed it in determining the origin and nature of the so-called endothelioid cell. He believes that this cell comes from the reticular cells lining the sinuses of the lymph-nodes. Hence, the author states, the term "reticulo-endothelial" leucocyte has come into vogue.

Warren repeated the work of Downey, using normal lymph-nodes of kittens and confirmed his findings. While doing this the question arose whether this method would throw some light on the question of the origin of giant cells and their mode of formation, and this present paper embodies the results as applied to the giant cells in tuberculosis. The material used in this study consisted of cervical lymph-glands and fallopian tubes obtained at operation, and of various organs obtained at autopsies.

The author concludes that the specificity of the silver impregnation method for reticular fibrils seems definitely established (Ferguson) and the demonstration of reticular fibrils in the cytoplasm of the so-called epithelioid or endothelioid cells in the tubercle, therefore, identifies them as of reticular tissue origin. The presence of fibrils in the cytoplasm, the similar morphological characteristics of the nuclei, the absence of nuclear divisions, and in some cases the existence of partial cell walls occurring in the smaller giant cells seem to him to indicate that they are the result of a fusion of cells of reticular tissue origin.

GEORGE E. BEILBY.

RADIOLOGY

Ewing, J.: *Radium Therapy in Cancer*. *J. Am. M. Ass.*, 1917, lxxviii, 1238.

The author claims that the action of radium on cellular tumor tissue is selective and specific. Its results depend partly on the nature and condition of the tumor but chiefly on the dosage used. He then describes the morphology of the changes in

tumor tissue following its successful application and he believes these to be specific and distinctive. In the main these changes are slow degeneration of tumor-cells and stimulation to regenerative growth of granulation tissue. Overaction is followed by complete simple necrosis. Under some circumstances it appears that the reaction of the normal tissues is a more essential curative factor than the direct action of the rays on tumor-cells. When the dosage is exactly adjusted, there is an absence of scarring upon healing. The time required for action is variable, depending upon the kind of ray used, intensity and duration of exposure, and nature of tissue treated. Radium probably acts upon tissues by an electrical ionizing force.

Regarding the practical value of radium therapy, the author endeavors to show what it has accomplished in the treatment of cancer, what the limitations of its use are, and what its future development seems likely to be. He warns against the issuing of incautious statements as tending to prejudice the layman against it. The complete clinical regression in some advanced inoperable cases of cancer has more than justified its use under those conditions. Its use is to be recommended only where the disease is localized, as its effects are confined to a limited area. Cautious palliative treatment only is usually the safest limit with very advanced cases to avoid unfavorable effects.

In operable cancer, results have demonstrated its usefulness in rodent ulcer and epidermoid carcinoma of the skin as well as in certain derivatives of basal cell carcinoma. In carcinoma of the cervix uteri numerous favorable results are cited. The results of treatment of advanced cases of uterine cancer as reported by different clinicians are quoted showing quite uniformly good results.

Buccal, lingual, labial, tonsillar, pharyngeal, and œsophageal carcinoma, as well as cancer of the breast and rectum, may all be favorably influenced, but recurrences are to be anticipated in all infiltrating cases. Lymphosarcoma and giant cell sarcoma of bone respond readily to treatment.

Among the difficulties encountered in the way of successfully employing radium, one of the chief is the effort to cure hopeless cases by resorting to the caustic effects of this agent, producing necrosis. Another is the failure to recognize that each case is a problem in itself and that proper selection of cases suitable for radium treatment is essential to success. The variable factors incident to its use largely govern results achieved and a standardization of methods of application would greatly facilitate the obtaining of uniform conclusions as to its value in different conditions. According to the author, even small doses do not stimulate cell growth but inhibit same. Susceptibility of normal tissue to repeated applications seems to increase while that of tumor-cells diminishes; hence the best results often follow a single massive dose in advanced lesions. Recurrences after radium treatment have been rather notably frequent, due probably to

persistent islands of tumor-cells. As most of the cases reported were advanced it is not fair to compare results with those of earlier operated cases. Radium intoxication may follow long exposures to large amounts of radium, especially in advanced and cachectic cases. Practical limitations render the use of radium in place of competent surgery inadvisable except in the hands of experienced men.

Regarding the future of radium therapy in cancer, the author believes that improvement in technique will lead to a wider range of usefulness for it. Results achieved thus far indicate that radium deserves a trial in all accessible and strictly localized carcinomata, especially if there is some contra-indication to operation. Study of comparative results will tend to give relative values of radium therapy and surgery and tend to definitely localize the field for each.

Experience to date would indicate that radium be used in advanced inoperable cases; that the scope of operability in some cases be reduced; that it be given preference over operation where some contra-indication to operation is present; and that it may possibly be the method of choice in some strictly operable cases. Its use is recommended in certain pre-cancerous lesions or those of a doubtful nature where it often is efficient and practically free from danger in the hands of an expert.

ADOLPH HARTUNG.

Knudson, A., and Erdos, T.: A Metabolism Study of a Case of Leukæmia During Radium Treatment. *Boston M. & S. J.*, 1917, clxxvi, 503.

The effects of surface application of radium in a case of leukæmia as indicated by the metabolic output in the urine of the patient forms the basis of this study. After a brief clinical history of the case, a description of the technique employed in the treatment and methods used in making analyses, the author tabulates and charts his findings in detail and reaches the following conclusions:

1. The excretion of total nitrogen, urea, ammonia, and phosphates are enormously increased immediately after the action of radium.

2. The uric acid output is only slightly increased compared to the other nitrogenous constituents.

3. Surface applications of radium over the spleen accelerates the disintegration of nuclein tissue, resulting in the above increases. The uric acid which would be expected to be formed by disintegration of nuclein is probably broken up further so that it is not increased.

4. The phosphates show the most remarkable results, increasing at times as high as 400 per cent over the excretions at the beginning of treatment.

ADOLPH HARTUNG.

Boggs, R. H.: Carcinoma of the Uterus Treated by a Combination of Radium and Roentgen Rays. *Am. J. Roentgenol.*, 1917, iv, 207.

Cancerous growths can be promptly and apparently permanently cured by radium at a depth of 2 or

3 centimeters if no metastases are present. At greater depths the penetrating rays obtainable from present roentgen tubes are far more effective. Hence the author strongly advocates that radium be supplemented by roentgen rays in the treatment of carcinoma of the uterus. He feels sure that smaller quantities of radium applied locally, with proper roentgen therapy from without, are equal if not superior, to any quantity of radium ever used up to the present time so far as the end-results are concerned. He arrives at the following conclusions:

1. While valuable statistics are being obtained, sufficient time has not elapsed to speak of definite cures, although several cases were recorded over eight years ago.

2. As a forerunner to, and a follower up of operation, radium is of unquestionable value. Relief of the symptoms in advanced cases is so marked that every practicing physician should at least familiarize himself with this fact.

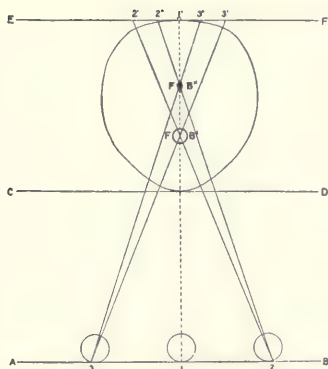
3. The offensive discharge and the hæmorrhage usually completely disappear. The discharge at the beginning which is so offensive to the family and nurses as well as to the patient usually completely disappears within two or three weeks. Almost every gynecologist who has followed the treatment of these cases will emphasize this remarkable feature in his report.

ADOLPH HARTUNG.

Straw, A. G.: The Use of X-Rays in the Great War, with a New Method for Location of Foreign Bodies. *Arch. Radiol. & Electrotherap.*, 1917, xxi, 392.

The author discusses, in a general way, the value of the roentgen method of examination in determining the presence or absence of foreign bodies, and also in making an accurate diagnosis as to bone injuries. The method of localization of foreign bodies advocated by Mackenzie-Davidson, he believes has several disadvantages, the first of which is the obliteration of the skin markings during the pre-operative scrubbing. He also considers the time taken to develop plates and work out the distances a handicap to the method.

Straw gives in detail the method he used during nine months' active service in a hospital in France, in which the fluoroscopic screen only was used. The technique requires a darkened room, X-ray table with tube underneath, with means of shifting the tube from one point to another. With the patient reclining upon the table, the fluoroscopic screen is placed above him. The excited tube is moved in such a position that the shadow of the foreign body will fall upon the screen; then the diaphragm opening is diminished to the smallest workable size, in order to cut out the divergent rays. Next, the tube is centered beneath the foreign body, when it is evident that the shadow on the screen is directly over the foreign body. A metallic ring mounted on a wooden handle is necessary with this method. This is passed beneath the screen and the ring is placed upon the



In the figure let AB represent the plane of the tube; CD the top of X-ray table; EF the fluorescent screen; FB' the foreign body to be located; FB'' the metallic ball on wooden handle.

skin with the patient in such a position that the shadow of the foreign body appears on the screen encircled by the ring. The screen is removed and the skin is marked with tincture of iodine or silver solution, giving the exact location of the foreign body in the ring, which is still held on the skin of the patient. A vertical line then passing through this mark would encounter the foreign body at some distance, providing the patient is kept in the same position at which the skin markings were made.

The depth of the foreign body is determined by one of two methods. If the foreign body is located in a part of the anatomy that can be rotated, proceeding as above, the distance between the parallel planes will indicate the depth of the foreign body.

If the foreign body is in such a position that its shadow cannot be obtained from two angles, the second method is used. A small ball is mounted on a wooden handle, and this is introduced under the screen, and placed on the body of the patient on a line with the foreign body, and excursion of the tube is made and measurements recorded. It is evident that the excursion of the foreign body will be greater than that of the metallic ball. The metallic ball is moved on the body away from the screen until the excursions of the foreign body and metallic ball are equal. Then after marking the position that the ball occupies on the skin, take the distance between two parallel planes passing through the two marks, as before, and you have the depth of the foreign body.

W. A. EVANS.

Bushnell, G. E.: Extension of Tuberculosis of the Lungs as Shown by the X-Ray. *Southwest. Med.*, 1917, 1, 15.

The author first deals in detail with the changes in the lung tissue which can be recorded on the roentgen plate. The changes in the lung tissue are due either to blood or to fully organized connective tissue. Blood imprints a shadow on the

negative only when it is present in abundance, as in the congestion of lobar pneumonia, or as in some cases of acute bronchial pneumonia. The shadows of the blood, then, are seen only in acute parenchymatous inflammation. The connective tissue in the parenchyma of the lung distant from the hilus is not normally present in sufficient quantities to delay appreciably the passage of the roentgen rays except as it occurs in connection with and as a part of the various tubes, bronchi, blood-vessels, and lymphatics.

The presence of connective tissue, then, is evidence of a chronic inflammation. The author emphasizes strongly that the tubercle cannot be seen on the roentgen plate, but what is seen is the result of a tuberculous inflammation. Failure to appreciate this may lead to a faulty diagnosis, in that a healed tuberculosis may be mistaken for an active process.

The method of distribution of tuberculosis is fully discussed. The author points out the area of the lung in which there is more or less circulatory stagnation, and it is in these regions that the deposit of tuberculosis is seen. Several conditions are mentioned as necessary for the development of infections. The author's theory is that in thoroughly immune individuals in perfect health, the bacilli are shut up in the bronchial glands, and developed only under favorable conditions, these being: (1) the proximity of large collections of tubercle bacilli. Other things being equal, extension will take place first from the largest focus in the body. (2) Other extensions will take place in locations in which the tubercle bacilli are shielded from contact with the antibodies which circulate in the blood — they will progress in relatively non-vascular regions. (3) They will seek locations in which they can multiply without being disturbed by motion, not only because rest is essential for a colony growing by supposition under the most difficult conditions, but because motion means function, and function is accompanied by vascularity.

Applying these laws, then, to the extension of tuberculosis, we should find that the process begins in the hilus glands. It spreads through the non-vascular tissue of the lung, avoiding the vascular parenchyma and being restricted to the perivascular and peribronchial structures. And even here it will be confined to the parts of the lung of least motion, that is, the paravertebral portion of the lung, and especially to the paravertebral portion of the upper lobes.

In the majority of individuals having no clinical tuberculosis, roentgen plates show evidence of tuberculosis involving the deep lung, especially of the lower lobes near the spine. These deposits are old, and indicate a tuberculosis in these parts in early life, the lower lobes being the favorite seat of tuberculosis in children. In the adult in whom the apices are well developed, the extension occurs chiefly into the paravertebral portions of the upper lobes. There are many cases in which clinical

tuberculosis has never been demonstrated, and in which this process extends well up into the upper lobe, but does not reach the superficies of the lung. This fact demonstrates the course of the disease, that is, it must have been propagated from below upward, not, as is often thought, from above downward.

The following subdivision of deep pulmonary tuberculosis is offered:

1. Tuberculosis limited to the bronchial glands.
2. Tuberculosis capable of extension only in parts of least motion — paravertebrally upward. In the highest immunity the process is strictly a tuberculous lymphangitis of the bronchi.
3. Tuberculosis extending upward and outward as well as directly upward. The ability of the tubercle bacilli to maintain themselves in parts of greater mobility speaks for a lesser immunity, hence generally invasion of the parenchyma — a peribronchial bronchopneumonia rather than a peribronchial lymphangitis—but cases are met with in which the disease is shown by the X-ray to be practically limited to the peribronchial lymphatics.

4. Tuberculosis extending peribronchially in all directions. Here, too, there may be abortive cases in which the disease is limited to the lymphatics. As a rule, however, the process quickly becomes a tuberculous bronchopneumonia.

Diagrams are shown of 984 chest plates which bear out the author's contentions. Only 2 out of the 984 chest plates showed typical apical tuberculosis. In 82 there was evidence of paravertebral tuberculosis alone. In 45 of the 82 cases there were no definite physical signs, while all of the 82 cases gave, at one time or another, definite symptoms of tuberculosis, and all, with two exceptions, had a positive sputum.

The author states that it should be borne in mind that in this discussion he considers only tuberculosis of the relatively immune subject.

W. A. EVANS.

Holding, A. F.: Improved Cancer Prognosis Justified by Deep Roentgen Treatment. *Am. J. Roentgenol.*, 1917, iv, 183.

Observations made by the author in over 700 hopeless cases of malignant tumors treated with deep roentgen rays have demonstrated the scope of usefulness of this agent in deep-seated cases of malignancy and led him to formulate the following conclusions:

1. The therapeutic value of roentgen rays is real and is based upon the well understood physiological action of these rays.
2. There is a relationship between the morphology of tumors and their susceptibility to the action of roentgen rays.
3. The knowledge of the physiological action of the roentgen rays and the morphology of tumors enables one to make a reasonable prognosis as to whether a given case will react favorably or unfavorably to roentgen rays.

4. Symptomatic recoveries are to be expected in cases of lymphosarcoma, and some cases of carcinoma of the breast, adenocarcinoma of the ovary, carcinoma testis of teratoid origin, and tumors made up of embryonal types of tissues.

5. The attitude so widely held that all operable tumors ought to have a cutting operation is wrong.

6. In order to give their tumor patients the best treatment, surgeons must employ roentgentherapy as well as coagulation and excision, as each is indicated.

To bear out some of these conclusions, the author cites in detail the case histories of patients with lymphosarcoma, alveolar carcinoma of the breast, adenocarcinoma of the ovary, carcinoma testis of teratoid origin with abdominal metastases, embryonal carcinoma of the chest, and embryonal carcinoma of the posterior nasopharynx. ADOLPH HARTUNG.

Negro, C.: Direct Electrization of Nerve-Trunks During Operation for War Wounds by the Faradaic Unipolar Current (Sull' elettrizzazione diretta dei tronchi nervosi, durante un atto operatorio, nei feriti di guerra, col metodo della corrente faradiche unipolair). *Gior. r. Accad. di med.*, Torino, 1916, lxxix, 470.

Recently Marie has called attention to the importance of direct electrical exploration of the nerve-trunks during surgical intervention for nerve-lesions. Such exploration serves to identify the nerves situated in the operative wound, especially when their relations are modified by traumatism; also to test the value of their conductivity, etc. Marie and Gosset in their investigations use the bipolar electrode apparatus of Meige.

The author in a series of experiments on animals has found that faradaic unipolar excitation is much superior to bipolar. He gives the technical reasons for this and trusts that surgeons in their interventions will be able to verify his findings by using this method.

W. A. BRENNAN.

MILITARY SURGERY

Morestin, H.: Contribution to the Study of the Treatment of Salivary Fistulæ Consecutive to War Wounds (Contribution à l'étude du traitement des fistules salivaires consécutives aux blessures de guerre). *Bull. et mém. Soc. de chir., de Par.*, 1917, xliii, 845.

Since the beginning of 1915 Morestin has treated 62 salivary fistulæ, 30 being glandular and 32 fistulæ of Stensen's duct. Of the glandular fistulæ 6 were cured after treatment by the thermocautery; 26 were extirpated; 24 were cured without the least accident.

In the fistulæ of Stensen's duct, the author thinks that the best treatment in many cases is obliteration of the duct, which naturally comprises physiological suppression of the corresponding parotid gland. Although this is a very radical procedure he is led to it by several considerations as he has

found in the patients treated that reimplantation of the duct after elimination of the fistulized portion was impossible and internal drainage pure and simple rarely utilizable. Extirpation of the fistulous tract is therefore imposed as an absolute necessity. His procedure then is to extirpate Stensen's duct, ligature its stump at its origin, and obtain reunion without drainage. The obliteration of the canal brings about the rapid physiological death of the parotid gland, but Morestin says that this has no perceptible effect on the organism.

In 16 cases an incomplete eradication of the canal was done with establishment of drainage toward the buccal vestibule. All recovered and as far as Morestin knows the fistulæ has been cured, but he cannot say with certainty that an artificial canal was not established in any of these cases.

In 13 cases the complete radical operation has been done with excellent results, and Morestin now employs this method exclusively.

The general conclusions drawn is that when such a fistula does not spontaneously close the most general and most essential indication from the point of view of operative technique is to extirpate with the greatest care, at the same time as the fistulous tract, the whole of the fibrous tissue through which it runs so that only supple and healthy tissues are left. In glandular fistulæ suture and hermetic reunion of the glandular walls suffice to occlude the salivary orifice.

In fistulæ of Stensen's duct there are two methods: (1) extirpation of the fistula, of the fibrous tissues, and the mutilated part of the duct with vestibular drainage; (2) extirpation with ligature and burying of the stump. Both have given good results; but the second method is particularly to be recommended.

W. A. BRENNAN.

Walters, C. F., Rollinson, H. D., Jordan, A. R., and Banks, A. G.: A Series of 500 Cases of Emergency Operations for Abdominal Wounds.
Lancet, Lond., 1917, cxcii, 207.

The 500 cases were operated upon at a clearing station near the fighting line in a house with steam heat, which already had one operating room to which another was quickly added. The report is more of an attempt to summarize results of experience in diagnosis and treatment than to attempt an elaborate description of them.

The patients were received as early as three hours after being shot, but some were received after the lapse of a greater length of time.

Time element in prognosis and treatment. The authors state that an abdominal patient's chances diminish with every hour of delay. The vast majority reached hospital care in 8 to 10 hours, and a large percentage in half that time. Some arrived three to four days after they were shot. These late cases are usually inoperable, the visceral injury is not severe and nature has made an effort to deal with the condition. In cases wounded four or five days, with general peritonitis, the practice was to drain

the pouch of Douglas through a small incision. In cases where intestinal wounds had healed recovery followed.

The authors recognize that in this war, as in other recent wars since the adoption of the armored rifle bullets, not all cases of perforating wounds of the abdomen are fatal and "that severe visceral injuries can be and are cured by natural means." Still, operation is believed to enormously increase the patient's chances of recovery. The mortality of a large number of cases operated upon is fixed at about 50 per cent and although there is no data in this war on which to base the mortality of unoperated cases, the authors have reason to believe that it would be somewhere in the region of 90 per cent.

In the diagnosis and prognosis of patients on admission, two questions arise: (1) Is the patient able to stand operation? (2) Is he suffering from a true penetrating abdominal wound with injury to hollow viscus?

In answering the first question, the patients exhibiting the two extremes are soon passed upon: (1) The obviously moribund man — cold, pulseless, and dying offers no difficulty in coming to a decision. Operation on a patient in this condition cannot be considered. (2) On the other hand there is no doubt of the patient's ability to stand operation, if his condition is good and he has been shot only four or five hours before examination. Whether the case is doubtful as to the actual presence of a perforating wound, it is always one for exploratory operation at least, because the shock of laparotomy is not considered harmful in such cases.

The chief difficulty in deciding whether the patient is able to stand operation is found in patients who occupy the middle ground between those discussed — those whose condition is poor, who have received their wounds hours before. If serious visceral injury is certain as in the case of protruding intestines, operation is in order unless the patient has reached the moribund stage. Such a patient may improve if kept in a ward, warm and at rest, for one or two hours. His condition is then more favorable for operation. If he fails to rally in that time — in two hours — he seldom recovers sufficiently to be operable in less than thirty or forty hours.

In regard to the second question — "Is he suffering from a true penetrating abdominal wound with injury to hollow viscus?" — there are cases of severe injury to a hollow viscus without penetration of the peritoneum — in cases for instance in which the abdominal wall has been bared by a passing shot. Again, in such cases the crushing force exerted outside has been known to tear subjacent loops of intestine in two.

Another preliminary point to consider is that of injury to solid viscera. If it can be determined that only a solid organ has been injured, is operation indicated? The authors answer the question in the negative, except in kidney wounds. Wounds of the liver are seldom if ever benefited by operation.

When severe they are fatal; when not severe the hæmorrhage has usually ceased at operation. The same rule applies to wounds of the spleen, except in those cases in which the spleen wound is causing shock and then operation is undertaken with a view to splenectomy.

In the diagnosis of penetrating abdominal wounds speaking generally the main point in diagnosis is injury to hollow viscera.

The principal points of value in diagnosis are: protrusion of intestine or escape of intestinal contents, fluid or gas through the wound, or when an injury to a viscus can be seen or felt through the wound. It should be remembered that surgical emphysema due to escape of intestinal gas subcutaneously, occurs in a small percentage of cases.

If the intestine protrudes in the wound, it is necessary to determine whether it is strangulated or what its condition may be. If in fair condition and not strangulated the prognosis is more favorable.

The authors mention a case in which all of the small intestine, the transverse colon, and the great omentum were prolapsed through the wound; the parts were wrapped in a khaki shirt in which they laid for eight hours. On examination the intestines were found to be covered with mud. After a cleansing process under an anæsthesia the protrusions were returned to the abdominal cavity and the patient subsequently made a good recovery. When resection becomes necessary in such cases the result is nearly always fatal. Protruding omentum is not a dangerous condition, but it is an invariable guide for operation as it denotes visceral injury.

Through-and-through shots are at times misleading. A shot entering the flank and escaping at the umbilicus may traverse muscle alone. It is well to be guided by the anatomy of the parts lying between the wounds of entrance and exit.

The degree of dilatation of the stomach and urinary bladder, and the position of the diaphragm at the time of the injury are factors impossible to determine.

The authors call attention to a valuable sign and that is that wounds of the chest alone may give all the signs of an abdominal injury, and also, wounds of the back and buttocks which give rise to retroperitoneal hæmatomata may set up marked abdominal rigidity and tenderness. The latter of these wounds has been mentioned by nearly all observers of experience in abdominal wounds.

Pain does not rank high as a symptom since most of the patients have been dosed with morphia en route to the hospital. Severe pain immediately after injury lasting a few minutes is often noted in visceral injury.

Vomiting occurs in the majority of visceral wounds. It is common in stomach wounds. There may be a wound of the stomach without hæmatemesis. Passage of flatus following reception of the wound, negatives injury to the large gut, especially the descending colon.

An appearance of extreme shock betokens grave

injury, and it is a better guide than the condition of the pulse. A normal facial expression favors the existence of a small amount of injury.

Abdominal signs. 1. Rigidity and absence of free movement is of much importance from a negative point of view. Its absence precludes visceral injury. Its presence however may be due to other causes: chest wounds, retroperitoneal hæmatoma, or injury to the abdominal wall alone.

2. Tenderness is of far more importance. Its presence at some distance from the wound, especially on the opposite side from the wound, is almost diagnostic of visceral injury. It should be remembered that tenderness may also be due to hæmorrhage in the peritoneum, or in the tissues of the anterior wall. The latter will at times cause extreme tenderness.

3. Percussion signs are fallacious, and little importance is attached to them.

4. Rectal examination is seldom of value.

5. The passage of a catheter may afford valuable evidence in cases of injury to the bladder and urinary passages.

In deciding whether to explore or wait in a case which presents doubt as to the presence of perforation, the deciding factor is the patient's condition. When good, so that operation presents little risk and the wound is so recent that possibly serious visceral injury is present, it is far better to explore.

A small incision may be made in the middle line and a swab inserted in the pouch of Douglas, to determine the presence or absence of blood.

Cases in which there is little doubt of the existence of visceral perforation should nevertheless be watched most carefully. Without visceral lesion they tend to improve at once. Such cases may remain quiescent for a long period and then take a sudden turn for the worse. A rising pulse-rate, in the absence of elevation of temperature is a pretty sure indication for operation.

Contra-indications to operation are as follows:

1. Apart from the hopeless condition of the patient which presents itself in a certain percentage of cases, the only other condition hopeless to operate is a complete spinal lesion with paralysis. In addition to this serious condition, these cases are difficult to fathom as to diagnosis since the spinal lesion will give all of the abdominal signs without perforation existing. Lest spinal lesions be overlooked, every patient should be asked to move his legs.

2. An abdominal wound complicated by a chest wound with hæmoptysis or surgical empyema. The mortality in these cases is enormous and they are better let alone.

3. Any other serious wound forms an important complication. In a limb and demanding amputation, the best chance lies in doing the abdominal operation first, leaving the amputation to be done later. If both operations are to be done at the same time, one surgeon should be detailed to each operation.

Operative measures. Anæsthesia. Open ether by experienced anæsthetists, with or without chloroform, is used preceded by atropine. Warm ether apparatus (shipways) has recently been used with satisfaction.

The use of salines, before, during, and after operation: Primarily it may be said that salines have been of no value in shock, and of the utmost value in hæmorrhage. The most effective way to administer them is intravenously. Rectal administration is of little value as the solution is not readily absorbed in severe cases, and the danger of mechanically harming the abdomen should always be borne in mind.

In good and fair condition of the patient subcutaneous saline with Lane's bag has been used during operation; 1 or 2 qt. with 1 ccm. of pituitrin and occasionally 3i of adrenalin being infused during operation. Two cases were followed by cellulitis and both were fatal from gas gangrene in the original wound and in one the patient was infected at the point of inoculation with the bacillus aerogenes capsulatus.

In severe cases with hæmorrhage it is always preferable to use the saline intravenously, 2 qt. or more to be administered with brandy 3ii adrenalin solution 3ii and 1 ccm. of pituitrin. The practice is to give it slowly during the course of the operation in oss portion at once and the remainder later.

Rectal saline in after-treatment by intermittent small enemata, 3v to 3x (with brandy 3ii to 1 qt. to promote absorption) is given as a routine measure for some days. Intravenous saline in collapse, when collapse comes after operation is useless unless the collapse is due to secondary hæmorrhage — a condition seldom seen in abdominal cases.

Incisions: If the location of the injury is uncertain and the small intestine is almost certainly injured, a long (6-inch) middle-line incision extending above and below the umbilicus is recommended. It should be made to one side of the linea alba.

2. When the injury is to one side of the abdomen with a possible colon wound, a vertical incision through the rectus has been most generally employed, but a transverse incision through the oblique muscles, extending into the rectus sheath (that muscle being pulled inward) may be employed.

3. Where injury to the flexure of the colon or the spleen is suspected, a paracostal incision through the muscles, and when necessary extended in the same way into the rectus sheath has been frequently employed. Such an incision gives good exposure and heals well.

4. Sometimes where a primary lumbar incision has been made in the case of a wounded kidney and the missile not being located, if injury to the peritoneum is suspected, it should be remembered that the peritoneum may be opened and explored, sufficiently at least, to establish the fact of presence or absence of injury through the lumbar region.

Except in cases of large wounds, the incision

should be made separate from the original wound. It should be closed completely to obtain first intention healing — drainage tubes are put in place through separate buttonhole incisions, unless the original wound can be utilized for a drainage tube. Excision of the skin about the original wound is recommended, likewise cleaning and draining with care all large ramifying wounds in the abdominal wall proper. Gas gangrene has been noted in such cases and it is very fatal.

Great emphasis is placed on the value of utmost care in closing the wound because of a relatively large number of wounds which have been known to give way as long as a fortnight after operation. The wound should be closed in layers. The use of a single row of deep sutures except in most desperate cases has been abandoned. The sewing in layers is done with chromic catgut, and the retention sutures of strong silkworm-gut, set well back, are removed on about the twelfth day.

The tendency of sutures to give way in war wounds of the abdomen and operative wounds in this region is due to the fact that the incisions are usually longer, and owing to frequent bronchitis and paralytic distention the sutures are subject to a greater strain than in civilian abdominal surgery.

In cases in which the damaged area cannot be identified, a complete examination of abdominal contents is in order, and to save time and lessen shock it should be done in an orderly careful manner.

It is preferable to examine the injured area first for the reason that in a desperate case it may be found that, for example, suture of the stomach, colostomy, and a double resection of the small intestine would be necessary, procedures that all require more time than the patient's condition could warrant since the patient would certainly die on the table if any of the operations suggested were attempted. In such cases the abdominal wound is closed, the patient is returned to the ward as inoperable, and morphia is administered until death occurs.

After the damaged area has been successfully cared for a routine examination should next be undertaken. Then the middle-line incision is used the surgeon beginning his examination at the ileocæcal valve or junction, since wounds are most frequently found in this region. The ileum is rapidly brought out in short lengths of one foot and examined, the uninjured gut being at once returned by the assistant. When a rent is discovered the injured portion is retained outside, the position of the first rent or hole being marked by a light clamp or otherwise. The portions retained outside are kept warm and moist by a hot towel, wet in saline, being placed over them. Having thus examined the ileum and jejunum, the transverse colon and sigmoid are inspected *in situ*, while the flexures, rectum, and bladder, which are not readily visible, should be inspected by touch. In some cases the missile will be found in Douglas' cul-de-sac, and this should be invariably examined.

Wounds of the upper viscera. In considering wounds of these organs it is well to remember that the stomach may be distended in the presence of a considerable hole or tear through its wall. Having found one orifice, a second should be looked for unless the missile has been located in the stomach.

Liver wounds. Uncomplicated liver wounds do not require operation. If the wound is small without hæmorrhage it is left alone. If large and bleeding, it should be packed. Suture is seldom possible, owing to the friable nature of liver tissue.

Spleen wounds. Small spleen wounds which are not bleeding may be left alone. Usually hæmorrhage is taking place, or it is easily excited by manipulation. Suture is easier than in liver tissue and moderate sized tears are sutured or packed. Splenectomy is resorted to in serious cases in which hæmorrhage cannot be controlled.

Kidney wounds. The authors prefer to deal with all kidney wounds through a lumbar incision since it is not always possible to diagnose the extent of injury otherwise. Other complicating visceral lesions are treated through an abdominal incision in the usual way. As to whether to suture, pack, or remove the kidney, the latter has been resorted to only when extensive damage has been found, such as a tear across the hilum with persistent hæmorrhage. In cases of injury where isolated portions of the cortex had been removed the large gap was successfully sutured.

Wounds of the intestines and bladder. Small intestine. Where the holes are small, a purse-string or single row of Lembert sutures will suffice. Double sutures are indicated only in large wounds prone to hæmorrhage.

Resections give twice the mortality found in sutured cases. If a resection is contemplated merely to save time, it is safer to employ sutures. Large resections recover as often as smaller ones.

End-to-end anastomosis has been done in preference to the lateral union. The latter takes a quarter of an hour longer and it does not give freedom from paralytic distention as claimed by some operators. Time should not be wasted in "over-elaborate stitching in anastomoses." The "leak" at the mesenteric attachment is classed by the authors as a surgical "bogey."

Short-circuiting of the injured and repaired gut to avoid paralysis is not recommended because post-mortem evidence has shown that paralysis is general as a result of peritonitis and not confined to the injured area.

Large intestine wounds. The authors report that these wounds are twice as fatal as small gut wounds. Fæcal fistulæ are common. Suturing is much more difficult than in the small intestine, making it necessary to invariably employ a double row. The use of antiseptic fluid is recommended after the first row has been put in place. A piece of omentum may be stitched over the repair. When necessary a separate "gridiron" incision in the flank may be made, to deal satisfactorily with ascending or de-

scending colon wounds. When possible suture is always preferable to colostomy.

The statement that large intestine wounds are nearly twice as fatal as those of the small gut does not accord with the experience in previous wars, notably, that of the British surgeons in the Anglo-Boer War. The experience in the Civil War also left a like impression. Otis records 59 cases of spontaneous recovery from gunshot of the cæcum and ascending colon, the descending colon, and sigmoid flexure and a few instances of the transverse colon. Nearly all the cases were complicated by fæcal fistula which closed spontaneously in the large majority of cases.

In forty cases in the Anglo-Boer War Stevenson fixes the mortality at 32.5 per cent notwithstanding the fact that some of them had sustained injury to the liver, bladder, and kidney. The same author fixes the gravity of gunshot wounds of the intestinal tract, irrespective of the stomach, probably in this order: small intestine, transverse colon, ascending colon, and descending colon, sigmoid flexure, and rectum.

The more hopeful outcome of injury to this part of the intestine has been ascribed to the fact that the walls of the gut are thicker than those of the small intestine, and the aperture in them is partially closed by the greater amount of tissue involved in the perforation. In addition the fact that the gut is fixed to the wall of the abdomen by the overlying peritoneum, it is more or less immobile, extravasation is not so likely to occur, and lastly the contents of the large gut being more solid, extravasation was less likely.

The only reason for the difference in the prognosis of small intestine and large intestine wounds by the different authors mentioned may be ascribed to the fact that the operators in the 500 cases under discussion were dealing with absolute facts as to location of lesions, whereas, the authors who have collected data in previous wars have largely estimated the lesions by guess-work — without opening the abdomen, by estimating perforation of certain organs in accordance with the location of the wound of entrance and the straight line between them. Compared to direct evidence as obtained after doing an abdominal section, the older method is fallacious and the authors are to be congratulated in having definitely settled an important point. (Reviewer).

Wounds of the bladder. Intraperitoneal wounds of the bladder only may be sutured with safety without draining suprapubically. A catheter is tied in place, and the pouch of Douglas is invariably drained. Extraperitoneal bladder wounds through the buttock which cannot be sutured should be drained thoroughly through the original wound down to and around the bladder wound by inserting a tube outside the peritoneum. Most buttock wounds involving the bladder are serious unless proper drainage can be accomplished. Hexamine should be given in all wounds of the urinary tract from the start until all danger of sepsis has passed.

Drainage of the abdomen after operation. Escape of visceral contents in every instance calls for drainage via Douglas' pouch. A drainage tube in contact with a suture in a large gut is apt to result in faecal fistula unless it is promptly removed about the second day. Any drainage tube has served its purpose of forming a channel in a very short time. Its presence therefore should not be unnecessarily prolonged.

After-treatment. The use of salines in the after-treatment has been referred to. Fowler's position is the rule. Rapid collapse — secondary shock — in twelve to twenty-four hours when a patient has apparently rallied from primary shock is one of the disappointing phenomena noted by the authors. In these cases intravenous saline is useless. Strychnia and brandy have accounted for a second rally at times.

Laparotomy in war is followed more often by vomiting than in civilian acute abdominal cases. If acute distention of the stomach is present, a stomach tube may cure the vomiting, but it should not be used in a condition of collapse.

The chief danger to a man shot in the abdomen is not general peritonitis, but shock and hæmorrhage. It is estimated that if these elements of danger could be eliminated the mortality in gunshot wounds of the abdomen could be reduced by 30 to 40 per cent.

The chief symptoms from peritonitis are: paralytic distention, vomiting, and constipation. As a prophylactic, a hypodermic of pituitrin followed in a half-hour by an enema on the day after operation is recommended by one of the operators. When obstructive symptoms with paralytic distention threaten a valuable drug is hypodermic eserine 1/100 gr. every two hours. Small doses of calomel, hypodermic pituitrin, and turpentine enemata are also recommended.

When these measures fail general peritonitis is usually present, and the case is well nigh hopeless. The incision can be opened up, and a collection of pus sought by separating adhesions near by. In some such cases this plan has saved some lives, not many.

Drainage tubes are removed early. Gauze packing — in liver and spleen wounds — is removed about the fourth day, under anæsthesia or in stages.

Operated cases are often disturbed by transport, which should be delayed as much as possible — never earlier than the end of one week, however well the patient may be. Most of the cases are transported to the base between the tenth day and a fortnight.

This valuable report is accompanied by the following table which is so full of interest that it is copied herewith. It should be noted that among the 500 emergency operations there were 57 laparotomies in which no injury to viscera were found, with the high recovery rate of 92.9 per cent. Classed as a report on gunshot wounds of the abdomen with the results as far as laparotomy is concerned, these

should properly be excluded from the table of results. The chances are that the cases would have recovered without operation. Without wishing to criticise the judgment of the operators in opening the abdomen for these injuries, it is fair to state that more of the cases would have recovered without operation. If these cases are put out of the reckoning, the recovery rate would still be very good, in keeping with the recovery rate in civil hospitals for laparotomy after gunshot wounds by pistols and revolvers. (Reviewer).

In Table I the mortality for colostomy is very high. So is it for retroperitoneal hæmatoma, gas gangrene of the abdominal wall, and wounds of the lung and abdomen. In the latter recoveries are confined to solid viscera.

Table II brings out the high mortality of abdominal wounds complicated by buttock wounds. Deaths here are caused by hæmorrhage, sepsis, and pelvic cellulitis. Wounds of the loin and flank, and chest suffered solid viscera involvement, and among them also are included the majority of the 27 cases in which no injury was found on operation, hence the low mortality.

The pulse chart shows that when the pulse is below 85 on admission the prognosis is very good, and when it registers above 110 it is very bad. It is noticeable that most fatal cases with low pulse-rate are buttock cases.

The conclusions are:

War wounds of the abdomen compared with those in civil practice show many radical differences as to (1) gravity, (2) complications, and differences in (3) characteristic features, (4) environment.

1. War wounds are more apt to be grave than those in civil practice. This is especially true of wounds by shell fragments, shrapnel balls, and rifle bullets including of course, those from machine-guns when shots are inflicted at close range. In civil practice, the shots are nearly always received when the adversaries are facing each other, the direction of the bullet tract is usually anteroposteriorly. The anteroposterior shots are attended with a greater percentage of recovery than the oblique, transverse, and vertical wounds in war.

2. There are a number of complications that are especially prone to appear in war wounds as compared to wounds in civil hospitals.

a. The high power military rifle which has a maximum penetration of 28.5 inches in green oak across the grain at 50 feet is capable of enfilading the body from the head to the buttock, a degree of penetration not possessed by pistols or revolvers, the weapons which usually inflict wounds in civil communities. As a consequence soldiers often show wounds through the chest and abdomen, or vice versa, and these shots are notably attended with high mortality.

b. Infection by faecal microbes, in the present world war at least, is a very fatal complication — only one case recovered out of eleven noted in this report.

TABLE I. MORTALITY RESULTS OF FIRST 500 OPERATIONS

Total: 245 lived, 255 died. Recovery-rate, 49 per cent

Class	Nature of Visceral Injury	Total No.	Result		Recovered per cent
			Lived	Died	
1	Stomach — No other injury.....	9	6	3	66.6
	Stomach — All stomach wounds.....	23	8	15	34.7
	Small intestine — Sutured; no other injury.....	64	40	24	62.5
	Small intestine — Sutured; all cases.....	96	53	43	55.2
	Small intestine — Resections alone.....	58	18	40	31.0
	Small intestine — Resections all cases.....	90	26	64	28.8
3	Large intestine — Sutured; no other injury.....	45	21	24	46.6
	Large intestine — Sutured; all cases.....	110	43	76	36.1
	Large intestine — Colostomy.....	13	2	11	15.3
4	Liver — Pure liver wounds.....	27	13	14	48.1
	Liver — All liver wounds.....	58	19	39	32.7
5	Spleen — No other injury.....	11	6	5	54.5
	Spleen — All cases.....	17	8	9	47.0
6	Kidney — Pure kidney wounds.....	10	6	4	60.0
	Kidney — All cases.....	20	12	8	60.0
	Kidney — Nephrectomies.....	2	2	0	100.0
7	Bladder — Pure bladder wounds.....	0	5	4	55.5
	Bladder — All bladder cases.....	25	12	13	48.0
8	Rectum — Alone.....	3	2	1	66.6
	Rectum — All cases.....	9	5	4	55.5
0	Laparotomy — (a) With no injury found.....	57	53	4*	92.9
	(b) Retroperitoneal hæmatoma only.....	23	9	14	39.13
	(c) Bruising of intestine and hæmorrhage.....	9	7	2	77.7
10	Cases in which peritoneum was opened by original wound but no visceral injury.....	10	6	4	60.0
11	Cases with protrusion of intestine†.....	16	6	10	37.5
	Cases with protrusion of intestine uninjured.....	5	3	2	60.0
12	Wounds of chest and abdomen‡.....	27	5	22	18.5
13	Gas gangrene of abdominal wall.....	11	1	10	9.0

* All these cases had other wounds. None died from operation.

† Included in some cases under small intestine.

‡ These cases had wounds of lung. All that recovered had only solid viscera injured in the abdomen.

TABLE II. REGIONAL MORTALITY OF 467 CASES

	Lived	Died
Anterior abdominal wall.....	96	97
Flank or loin { Right.....	28	20
{ Left.....	34	29
Chest* { Right.....	26	25
{ Left.....	25	20
Buttock (either side).....	18	49

* I.e., wounds above rib margin — not only wounds of lung, for mortality of which see Table I.

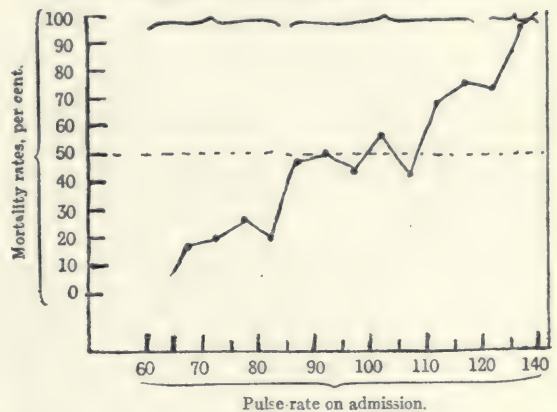
N. B.—In this table where there are through wounds with exit and entry in different regions the case is classified in the category standing lowest in above scale — i.e., "Anterior abdominal wall and buttock" — under "Buttock."

c. Mental shock, exhaustion, and fear are no doubt more frequent complications of war wounds than in those occurring in civil practice.

d. Poison by gas shells, not known in civil practice, comes in this present war to add to the gravity and complication in abdominal war wounds.

e. As to the difference in characteristic features of civil practice and war wounds of the abdomen, in civil practice the shots are delivered by weapons of much lower velocity. The projectiles are mostly from regulation pistols and revolvers of medium caliber, 32, 38 and less often, 45 caliber. The amount of laceration and devitalized tissue is less

Curve to show Relation between Pulse-rate and Mortality.



than that of the military rifle bullet at close range, the shrapnel ball, or shell fragments.

f. Environment plays a great part in peace and war. In war the surgeon is at the mercy of the conditions about him. For many reasons it may be hours and days before a patient can be transported to the hospital for treatment. Adverse conditions of the kind mentioned are seldom noted in civil practice. The surgeon dominates the surroundings and it is seldom more than one hour before operative interference can be undertaken should it be deemed necessary.

The reviewer is prompted to call attention to these differences in civil and military practice all the more on account of the favorable recovery rate, about 50 per cent, attained by Walters, Rollinson, Jordan, and Banks. While their work was favored by the fixed position of the combatant armies in trench fighting, the team work accomplished by this unit exhibits a high order of efficiency. We are not aware of any recovery rate that compares with theirs in war surgery. L. A. LAGARDE.

Lyle, H. H. M.: Disinfection of War Wounds by the Carrel Method, as Carried Out in an Ambulance at the Front. *J. Am. M. Ass.*, 1917. lxxviii, 107.

The Carrel method of sterilization of wounds consists in the careful application of a disinfectant until the wound is proved aseptic, followed by suture without drainage.

The careful clearing up of the wound and removal of foreign substances as a preliminary step is very important. The wound is left wide open. Dakin's fluid is then conveyed to every portion of the wound by means of tubes with multiple perforations. Through these tubes Dakin's fluid is passed into the wound every two hours. Daily examination of the smears from the wound is made, and when the wound has been practically sterile for several days layer suture is done without drainage.

J. H. SKILES.

Morowitz, B. F.: The Treatment of Wounds in Bulgaria. *Internat. J. Surg.*, 1911, xxx, 171.

In a brief report, based on five months' observation in Bulgaria, Morowitz states that the general surgical technique in Bulgarian hospitals is very poor. The methods are essentially primitive, and in most cases unscientific.

Asepsis is disregarded in the pursuit of antisepsis, and quite commonly the infected and clean cases are operated on the same table.

There is no medical school in Bulgaria and the physicians receive their medical education abroad, coming back soon after graduation with little practical preparation for surgery. The delay in proper treatment of wounds often brings disastrous results, requiring radical operations, which are done in Sofia, the capital. The nurses are more or less untrained peasant women who frequently dress the wounds themselves, displaying great ignorance of the elementary principles of asepsis. L. R. GOLDSMITH.

Penhallow, D. P.: Secondary Sutures of Gunshot Wounds. *Mil. Surgeon*, 1917, xl, 274.

The primary function of the military surgeon is to conserve life and to return the soldier to the firing line as soon as possible. The secondary suture of gunshot wounds shortens the convalescence, decreases the impairment of function, and lessens the likelihood of subsequent discomfort.

The technique consists in first making the wound as aseptic as possible and then closing the suture. The quickest way to sterilize the wound is by the use of hypochlorous acid solution. After from four days to a week the wound is ready for suture. The skin is carefully undermined, the edges of fascia and muscles approximated by suture and tension sutures placed in the skin as far back from the skin margin as possible. The skin edges are then sutured. Tension sutures are removed early to avoid sloughing and their place taken by adhesive strips. A small gauze drain is inserted. Primary union usually results. J. H. SKILES.

Proust, R.: Advanced Surgical Grouping (Groupe-ment chirurgical avancé). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 84.

Proust gives the details of a new arrangement of the surgical service at the front. The wounded from the first-aid stations are generally transported to a first line surgical ambulance, where they are examined, bandaged, sometimes operated upon, and then transported to a surgical center where they are operated upon and hospitalized if necessary.

In Proust's opinion the surgical ambulance causes useless delay and works an injustice to the wounded and should be suppressed. The majority of the wounded should be transported at once directly with neither relay nor delay to the surgical centers. But for another category of the wounded it is necessary to make special provision by formations in the first line which are equipped for urgent operation of selected wounded.

It is the details of this advanced surgical service that Proust now reports on: The central first-aid station immediately behind the firing line has its functions enlarged and in it, in extreme cases, ligation of vessels or a tracheotomy may be done. The surgeon in charge selects the wounded for treatment in the advanced surgical group and sends the others to the surgical center. The advanced surgical group is an automobile service consisting of (1) an administrative section, (2) a transportation section, (3) an operating section, and (4) a hospital section.

The details, both as regards personnel and equipment, of this extensive mobile surgical unit are given in the original article. W. A. BRENNAN.

Flint, J. M.: A Combined Method for the Localization and Extraction of Projectiles. *Mil. Surgeon*, 1917, xl, 259.

Many methods for the localization and extraction of bullets and projectiles have been brought forward during the present war. The method proposed by the author is very ingenious and deserves very careful consideration.

The first step is to locate by means of the fluoroscope and looped compass a series of points on the body. Imaginary diagonals through these points would necessarily pass through the projectile. In order to obtain a graphic idea of the relations of the projectile a band of soft metal is encircled around the body and the localization of the several points above mentioned are marked on the band. This band is then transferred in the same shape and size that it had while on the body to a sheet of paper and a tracing made around the band. This tracing represents the shape and size of a cross-section of the body at the level of the projectile. The several points marked on the metal band are then marked on the paper, diagonals drawn through them, and the depth of the projectile thus determined. By reference to a cross-section atlas the relations can easily be traced in the drawing and the same used for reference during the operation.

The proper site for incision can then be traced on the patient and the patient then sent, along with the chart, to the operating room. J. H. SKILES.

Archibald, E., and Maclean, J. W.: Shock as Seen at the Front. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

An analysis is given of 40 cases of shock due chiefly to wounds of the abdomen and high explosive wounds of the extremities as seen at a casualty clearing station, situated five to seven miles behind the trenches.

Attention is called particularly to the subnormal temperature found in bad cases of shock, in which the ordinary clinical thermometer was often found to be insufficient, that is, that the patient's temperature was obviously below 92°. This suggests the desirability of a new form of clinical thermometer with a register running from 80° F. up. Attention

was called to the observations of Gordon Holmes, who found in cases of injury of the cord at the sixth to eighth cervical segments a temperature of 80° , which was compatible with life for several days.

An analysis of the author's cases shows the profound effect of fatigue, cold, and exposure to wet, in the production and aggravation of shock. From numerous blood-pressure observations, the general rule might be deduced that in the presence of a pressure of below 75 mm., recovery was the exception.

Of seventeen cases with a blood-pressure of below 75 millimeters only three rallied from shock, and they died in two to three days from gas gangrene.

While hæmorrhage, even of moderate degree, is apt to aggravate shock, in the authors' opinion there is a fundamental difference between the two; and the recent view of Mann, Gatch, and others, that the two were essentially of like nature, was combated. In severe shock there is apathy and cyanosis, as opposed to restlessness and blanching in hæmorrhage; another striking difference lay in the effect of intravenous salt, or of blood transfusion — helpful in hæmorrhage, useless in shock.

In treatment, Hogan's gelatine solution restored blood-pressure and held it up longer than did intravenous saline; and both were of some benefit in the milder cases of shock combined with hæmorrhage. In bad cases, neither was of permanent benefit. Transfusion was disappointing. It had no more permanent effect than the gelatine solution. Pituitrin was of some value in moderate shock, but not in serious shock. Amyl nitrite was of no value.

In blood-pressure readings, the systolic pressure is not so important as the diastolic. Systolic may occasionally be up near 100, and diastolic 20 to 40; this spells shock. If the intravenous saline raises a low systolic, but fails to raise the diastolic, shock is still present and unrelieved and the patient will die. If the sharp click of the systolic is weak or distant throughout, there is danger. If the systolic sound is first heard only during expiration, and becomes continuous only some 10 to 20 mm. lower, such cases are always in shock and blood-pressure is low. These cases frequently die. A man with the ordinary symptoms of shock whose systolic is 65 or below, rarely recovers. One whose blood-pressure is low from hæmorrhage alone, will frequently recover with salt infusions. Ordinary hæmorrhage unaccompanied by fatigue or cold, does not reduce the blood-pressure materially.

The author discusses briefly the origin of shock in the light of clinical observations and recent physiological work. By exclusion it would appear that the trouble begins in the vast capillary system, and is characterized chiefly by a loss of blood-plasma into the tissues, and very possibly into the tissue-cells, rather than into the lymph-spaces. This, however, is not equivalent to plain hæmorrhage inasmuch as the process is apparently progressive, so that transfused blood is soon lost out of the blood-vessels just as is salt solution. Attention is called to the recent English work concerning these points. The ultimate cause of shock still remains undetermined.

GYNECOLOGY

UTERUS

Recasens, S.: Radiumtherapy in Cancer of the Uterus (La radiumtherapie dans le cancer de l'utérus). *Arch. mens. d'obst. et de gynec.*, 1917, vi, 34.

Recasens divides his treated cases into three groups: (1) cases which may be considered operable; (2) inoperable or where even a very extensive exeresis would not guarantee the extirpation of the invaded area; (3) cases of recurrence after uterine extirpation. A fourth group is added comprising cancer of the uterine body located entirely above the isthmus.

The statistics of each group are shown in the following table:

GROUP 1—OPERABLE CANCERS

Number of cases treated.....	16
Number of recoveries.....	16

GROUP 2—INOPERABLE CANCERS

(a) Cases treated for more than two years.....	47
Dead { in 1914.....	7
in 1915.....	8
in 1916.....	3
Metastatic reproduction.....	2
Clinical recoveries.....	27
(b) Cases treated for more than 1 year.....	79
Treated with radium alone.....	45
Treated with radium and X-rays.....	34
Dead { 1915.....	18
1916.....	11
Metastatic reproductions.....	5
Clinical recoveries.....	45
(c) Cases treated less than one year.....	76
Dead.....	14
Clinical recoveries.....	32
In course of treatment.....	30

GROUP 3—PATIENTS TREATED AFTER HYSTERECTOMY

(a) After vaginal hysterectomy.....	3
Dead.....	1
Clinically recovered.....	2
(b) After abdominal hysterectomy.....	2
Dead.....	1
Metastatic reproduction.....	1

GROUP 4—CARCINOMA OF UTERINE BODY

Number of cases treated.....	16
Dead.....	6
Clinical recoveries.....	8
In course of treatment.....	2

COMPLICATIONS MET WITH IN THE COURSE OF TREATMENT

Rectovaginal fistulæ.....	5
Vesicovaginal fistulæ.....	3
Vesico-uterine fistulæ.....	1
Late hæmorrhages.....	2
Renal metastases.....	5
Metastases in other organs.....	1
Compression of the iliac veins.....	1
Intestinal occlusion.....	1

In none of the cases did the author observe any ureteral lesions due to the radiation.

The most important point the author gleaned from his observations was that 70 per cent of inoperable carcinomata of the neck of the uterus may be cured by the use of radium and X-rays employed together, and that for selected cases the percentage of recoveries rises to 95 per cent. As regards carcinoma of the corpus, in thin women operation is preferable, but in obese women in spite of the inconveniences of treatment there is recovery in 50 per cent of the cases.

Without admitting that this new method of treatment is a definite solution of the treatment of uterine cancer in the author's opinion its success has not been surpassed by any other methods, even by the most radical surgery.

W. A. BRENNAN.

Iribarne, J., and Carelli, H. H.: Roentgentherapy in Fibroma of Uterus (La roentgenterapia en los fibromas del utero). *Prensa méd. argent.*, 1917, iii, 237.

The authors give the details of 9 cases of uterine fibroma treated by roentgen rays. They think that the action of the rays is to reduce the ovarian hyperfunction and that this directly affects the uterine tumor; that a relationship of dependency between the development of the myoma and hyperfunction of ovaries is evident; and that the action of the rays effects regression of the tumor with anatomic and functional restoration without suppressing the ovarian functions.

W. A. BRENNAN.

Raymat, M. F.: Roentgen Treatment of Uterine Myomata (Roentgenterapia en la tratamiento de los miomas del útero). *Therapia*, Barcelona, 1917, ix, 129.

Raymat reviews the entire subject of the value and indications of actinic treatment of uterine tumors including the methods employed and the results obtained by others as revealed in the literature.

From his study and from 38 cases treated personally he draws these deductions:

1. Deep roentgen treatment is very satisfactory in the treatment of fibromyomata of the uterus.

2. In some cases it is really curative and in some simply palliative; in still others it is a valuable adjunct to operation.

3. The chief effect of the X-rays is upon the cortical and *capa ovigenous* layers of the ovary. This action is however more marked in some cases on the muscular or vascular tissue constituting the tumor, and upon the uterine mucosa.

4. Seeing that the procedure is not without danger, every precaution should to be taken, par-

ticularly as to the size of the dose and the regulation of its applications.

5. Progress must be carefully followed during the treatment, and every modification watched in order to guarantee success.

6. The treatment should only be applied to women of 40 years and older.

7. The treatment is contra-indicated whenever pregnancy exists or is suspected. W. A. BRENNAN.

Schmitz, E. F.: Chronic Endometritis. *Med. & Surg.*, 1917, i, 230.

Schmitz bases his paper mostly on the work of Hitschmann and Adler in 1907. He points out the difficulty in diagnosing a chronic endometritis, as the usual microscopic signs of inflammation such round cell infiltration, plasma-cells, and leucocytes are usually found in the menstrual cycle of normal endometrium. Thus, one must find many plasma-cells before a diagnosis of inflammation can be made. The old idea of uterine hæmorrhage caused by glandular endometritis must be discarded along with the use of the curette except for diagnostic purposes or for an abortion.

W. F. HEWITT.

Maldonado Moreno, S. F.: Observation of a Case of Double Uterus (Observacion de un caso de útero doble). *Semana méd.*, 1917, xxiv, 487.

The case of double uterus reported by the author was discovered during the expulsive period of labor. Vaginal examination disclosed a vaginal septum which divided the vagina sagittally in two parts. The right orifice contained the deeply engaged foetal head. The septum obstructed the progress of the labor and the child was delivered by forceps.

Further examination showed the existence of two distinctly separate complete uteri, each having its own vaginal passage separated by the thick septum. It was observed that the non-gravid uterus accompanied the uterus in the state of gestation in its plastic and dynamic phenomena.

W. A. BRENNAN.

MISCELLANEOUS

Pollock, W. C.: Uterine Prolapse in a Child. *Med. & Surg.*, 1917, i, 182.

Pollock reports the case of a colored girl 13 years of age complaining of a protrusion from the vagina noted first five years previous and which was gradually increasing. Physical examination showed the patient to be a small poorly nourished girl with

well developed secondary sexual characteristics; a marked scoliosis but no signs of a spina bifida; pelvis tilted; double genu valgum; vaginal walls and elongated cervix protruding from the vulva; the levator ani atrophic. Operation consisted in anterior colporrhaphy, Emmet perineorrhaphy, obliteration of the cul-de-sac, and Webster round ligament shortening. The postoperative history was uneventful.

W. F. HEWITT.

Williams, J. T.: Prolapse of the Rectum and Uterus. *Med. & Surg.*, 1917, i, 188.

The author limits his discussion to prolapse of the rectum associated with prolapse of the uterus due to injury during childbirth. No less than 27 operations have been devised for rectal prolapse. These may be divided into 4 groups: (1) fixation operations, (2) excision of the prolapse, (3) narrowing of the anal orifice, (4) obliteration of the cul-de-sac of Douglas.

The author agrees with Webster and Cunningham that the chief support of the pelvic viscera is the pelvic fascia. Hence, his operation consists of these salient features: (1) ventral fixation of the pelvic fascia, (2) fixation of the rectum to the pelvic fascia, and obliteration of the cul-de-sac of Douglas, (4) restoration of the integrity of the anal canal.

W. F. HEWITT.

Henderson, H.: A Review of Certain Pelvic Cases Showing the Value of Vaginal Aspiration as a Differential Diagnostic Procedure. *J. Mich. St. M. Soc.*, 1917, xvi, 277.

Henderson reports six cases where the vaginal aspiration of the pelvic tumor was an important diagnostic aid in the differentiation of a pus tube from an ectopic pregnancy. His conclusions are:

1. It is impossible to differentiate clinically between atypical cases of ectopic gestation and purulent collections in the pelvis.

2. Typical cases of ectopic may be combined with pyosalpinx.

3. In case of a mistaken diagnosis, laparotomy in the presence of pus is a dangerous procedure as well as unnecessarily radical.

4. Vaginal aspiration is comparatively harmless, and may be used in the routine ether examination without materially prolonging the operation.

5. Abdominal aspiration is not safe.

6. Although blood in the pelvis does not always mean extra-uterine pregnancy, yet laparotomy is justifiable in the presence of such a finding.

W. F. HEWITT.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Echols, C. M.: **Some Observations upon Ectopic Pregnancy, Based upon Thirty-seven Cases Treated by Operation.** *Wis. M. J.*, 1917, xv, 408.

The report of 37 ectopic pregnancies operated upon by himself over a period of thirteen years, is impressionistic rather than detailed — emergency operations in the home and the like not permitting full histories and laboratory work. The value of his deductions lies in their being drawn by one operator rather than from miscellaneous sources.

The average age of 26 patients was twenty-eight years, the recorded extremes being twenty-three and forty-one years, respectively.

No Wassermann tests were made. There was no definite history of gonorrhoea, although in 7 cases the fimbriated end of the opposite tube was found sealed and in 2 the opposite tube had already been removed.

Only 10 of the women had previously borne children and 5 have since borne children, one having had 5 subsequent pregnancies. Several admitted abortions in the first year of married life.

The histories of all except two nursing mothers showed regular menses up to the time of conception.

Of 10 who had previously borne children 6 showed intervals of four to twelve years between the last childbirth and the ectopic, thus suggesting mechanical or inflammatory occlusion of the tube.

Of 27 patients 18 gave a history of three to eleven years of childless married life before the ectopic gestation. Most of the 18 had used precautions against conception or had induced abortion in early married life. Later relaxation of precautions seemed to show them sterile until the occurrence of the ectopic.

The most constant symptoms were localized severe pain and tenderness and persistent uterine bleeding; the onset was usually after a missed period previous to which there was most often a history of regular menses. Frequently the onset of symptoms was but three or four days past the menstrual time and rarely there was no missed period at all. The pains were not intermittent as in abortion but were severe and with each recurrence lasted from ten to thirty minutes; they were usually greater on one side than on the other. There were signs of shock in the acute hæmorrhagic cases only, less than one-third of the series. One or two degrees temperature was the rule with extensive hæmorrhage, whether acute or the slow accumulation of days. In twenty of the thirty-seven cases the accumulation of one or two quarts of clotted blood in the pelvis had not caused a lessened pulse volume nor pallor of the

mucous surfaces, though there was frequently a history of pain on defecation, due probably to immobilization of the lower bowel by the hæmatocele; a few cases of hæmorrhoids were similarly explained.

Nausea and vomit invariably accompanied extensive abdominal hæmorrhage and frequently accompanied slight hæmorrhage when attended with much pain. Frequent micturition occurred often with large quantities of clot. Sore breasts and morning nausea occurred in a few cases.

Metrorrhagia in the patients observed was practically never uninterrupted, there being an occasional day or two of cessation of the flow. The flow was most often clotted. The author makes the point that rarely, except in parturition, do clots of any size come from the cavity of the uterus but are formed instead in the vaginal vault and are thence expelled.

Pelvic conditions discovered at operation were as follows:

The uterus as a rule was somewhat enlarged and softened but with prolonged metrorrhagia; irrespective of the age of the foetus, it had usually returned to nearly its normal size. The decrease in size is attributed to desquamation in the metrorrhagia of the decidua vera, the latter in ectopics making up much of the increased bulk of the uterus.

There were but few fibroids or ovarian cysts.

Chronic inflammation had sealed the fimbriated end of the opposite tubes in eight of the quiescent cases.

The gestation sac and contents had been partially expelled through the free end of the tube in nine cases.

There were no interstitial ectopics in the list and but one pair of twins.

The size of the foetus varied from that of three months' development to so small that rupture occurred through a hole the diameter of a match, profuse hæmorrhage occurring through the latter small punctures.

There were no deaths in the series. However, all the patients were young or middle-aged and good operative risks and none of them were fat. Acute hæmorrhagic cases were operated upon as rapidly as possible. Since such cases were emergency operations in the home, there were no facilities for hypodermoclysis and those operated at more leisure elsewhere did not need it. Instead, a pint or two of warm salt solution was poured into the peritoneal cavity just before closing it up, the clots being previously scooped out but the unclotted blood left unmolested. Drainage was used but once, and even in that instance the author subsequently considered it unnecessary.

Echol's present practice is to save the ovary on the affected side but no portion of the affected tube. But one patient was recalled who developed symptoms suggesting adhesions; this case was operated upon three or four months after tubal rupture and had much clotted blood in the pelvis and abdomen. The patients rarely remained in bed longer than from twelve to fourteen days, although post-operative gas pains were fairly prominent compared with the usual clean laparotomy.

In the diagnosis the usual mistake is to consider an ectopic an incomplete abortion, toward which the history of missed periods, severe pelvic and abdominal pains, enlarged and softened uterus, and metrorrhagia might easily mislead. The error is further partly explained by the enormous variation in ectopics from the classic history and signs. However, ectopic pregnancy should be considered when, following regular menstruation, there is a missed period and subsequently a prolonged flow accompanied by recurring stabbing pelvic pains requiring an anodyne, especially if this history follows several years of childless married life. Digital examination and the entire history seen in proper perspective should be used as corroborative means.

Concerning operative management, the author advises strongly against postponing operation in acute cases with shock, against the removal of the unaffected tube in ectopic cases, and against the use of the vaginal route to secure the bleeding point in acute hæmorrhagic cases. He holds also, though many might survive without operation, that even though they were to do so, there would be the menace of long invalidism; so the possibility of survival is no valid argument against operation upon all cases.

The author is of the opinion that there is a relative and absolute increase in ectopics. As a factor he discredits the influence of venereal disease, believing rather that induced abortions and low temperature vaginal douches undertaken for birth control are the chief causes in tubal pregnancy.

Four abstracts of case histories are appended: (1) of ectopic twins; (2) of an ectopic in a nursing mother with no available menstrual symptoms to help diagnosis; (3) of an ectopic with no missed periods whatever; and (4) of an ectopic in an unmarried deaf-mute who indignantly denied the possibility of pregnancy.

JESSE D. COOK.

Young, E. B.: Eclampsia at the Boston City Hospital; a Review of the Cases of Twenty-three Years. *Boston M. & S. J.* 1917, clxxvi, 486.

During the past twenty-three years, 183 women with threatened or actual eclampsia have been admitted to the gynecological service at the Boston City Hospital. Thirty-six of these were admitted postpartum, having been delivered outside the hospital, either normally or by operative procedures concerning which little or nothing is known. The same applies to the details concerning the children. A few women (6 in number) were received early, as

threatened eclamptics, and, after treatment, left the hospital undelivered; while 14 others, entering with mild symptoms, miscarried or were eventually delivered.

The following conclusions are reached:

1. Incidence varies greatly in different years and without apparent cause.
2. Severe attacks occur mostly in primiparæ from 20 to 25 years, in the latter half of pregnancy.
3. A little over one-half the cases with convulsions have seizures after delivery.
4. Non-operative delivery is most favorable for the mother.
5. The longer the convulsions continue, the greater the mortality.
6. Child mortality is high whether deliveries are operative or non-operative, owing to prematurity and toxæmia.
7. High blood-pressure increases the gravity of the prognosis.
8. Venesection is a useful procedure in cases with high pressure and restlessness after delivery.
9. Induction of labor and delivery with the least possible operative interference offers the best chance of recovery for the mother.
10. Cæsarean section is justified in certain cases where delivery by other methods seems too prolonged or doubtful in outcome.

EDWARD L. CORNELL.

Ferroni, E.: Comparative Criticisms on the Principal Methods of Conservative Cæsarean Section (Criteri comparativi sui principali metodi di taglio cesareo conservatore). *Ann. di ostet e ginec.*, 1916, xxxviii, 393.

The author's experience is based on 57 cæsarean sections. Of these 9 were classical; 17 were extraperitoneal; 27 were anterior transperitoneal suprapubic (so-called cervical anterior); and 4 were transperitoneal with the Polano uterine incision (posterior cervical). In the 57 cases there was 1 maternal death due to the operation; of 56 fœtus born alive, 2 died.

The author thinks that in non-infected cases all methods give good postoperative and late results; the obstetrician should therefore be bound rather by the circumstances of the case in selecting the technique than to follow any prejudice in regard to this or that technique. The anterior transperitoneal suprapubic cæsarean section appears to be that which offers the best characteristics among the intra- and extraperitoneal methods. Besides, it is an excellent method in cases in which a cæsarean previously executed on the patient raises the assumption of the existence of abnormal relations between the bladder and peritoneum.

In infected cases there can be no discussion of preferences. The author thinks the Porro operation is indicated and in some cases embryotomy on the living fœtus.

In suspicious cases the author thinks after a discussion of the question that the choice of the best course to follow can only come from a more mature

experience. For the time being it must suffice to confirm the real importance of the lower incision of the uterus in suspected cases in regard to the prognosis for the mother; also to have shown that the extraperitoneal section, till now mostly indicated in such circumstances, may be replaced by the more simple suprapubic.

From the multiplicity of operative methods there are two advantages: both mother and fœtus have largely benefited in that the indications are widened and the prognosis bettered; secondly, the different methods permit greater possibility of adaptation to individual cases. W. A. BRENNAN.

Heimo, A.: Myoma and Pregnancy (Myome et grossesse). *Ann. de gynéc. et d'obst.*, 1917, lxxii, 449.

The author thinks that the modifications of uterine myoma by a coexisting pregnancy, viz., hypertrophy, softening, and dissolution, only rarely act as an obstacle to pregnancy. Thus in Beuttner's clinic at Geneva, from 1907 to 1914, surgical intervention has been necessary in only four cases. The particulars of the cases are given. In these four cases the myoma has had no effect on sterility. In all cases of myoma coming to the clinic since 1907 only 20 per cent have been sterile.

The author thinks that when a myoma is demonstrated in a woman sterile for ten to twenty years the myoma cannot be considered the cause of the sterility; and that the influence of myomata on sterility and pregnancy has been much exaggerated.

W. A. BRENNAN.

Campbell, A. M.: Hæmorrhage During the Latter Half of Pregnancy, *J. Mich. St. M. Soc.*, 1917, xvi, 167.

Campbell concludes as follows:

1. Hæmorrhage occurring in the latter half of pregnancy may be either accidental or unavoidable in type and in nearly every case is associated with some pathological condition of the uterus or the ovum.

2. It may be at times difficult to differentiate between the lesser forms of placenta prævia and premature separation of the placenta.

3. The treatment of accidental hæmorrhage depends upon the severity of the hæmorrhage and the urgency of the other symptoms.

4. The treatment of placenta prævia includes control of the hæmorrhage, immediate evacuation of the uterus as soon as the diagnosis is made and with a minimum amount of traumatism to the child.

5. Various methods of emptying the uterus may be considered. When the dilatation of the os is complete, version and extraction may be performed.

6. With incomplete dilatation, the rubber bag has been the most satisfactory method. Cæsarean section may be considered under favorable circumstances.

7. An effort to reduce the present foetal mortality of 50 per cent must be made. W. F. HEWITT.

Brindeau, A.: Salpingo-Ovarites Complicating Pregnancy. *Arch. mens. d'obst. et de gynéc.*, 1917, vi, 1.

The author discusses two types of inflammatory lesions of the tubes and ovaries, viz., those existing prior to pregnancy and those occurring during pregnancy. He has collected 93 cases from the literature and he gives histories of 12 personal cases.

The general maternal mortality in the author's cases was 42 per cent compared with 49 per cent in the statistics. The mortality rate differs for the various lesions. Thus for phlegmons of the ligament it is 30 per cent; for pelviperitonites, 55 per cent; for salpingo-ovarites, 62 per cent, in the collected cases.

In 44 of the 93 collected cases in which there was surgical intervention there were: 5 colpotomies with 3 recoveries; 1 abscess incision with 1 recovery; 1 craniotomy with 1 recovery; 10 salpingectomies with 9 recoveries; 3 laparotomies with 2 recoveries; 4 hysterectomies with 2 recoveries; 11 bilateral castrations with 11 recoveries; 1 ileus case treated with 1 recovery; 5 appendectomies and salpingectomies with 5 recoveries.

The total 44 surgically treated cases gave 38 recoveries, or 86 per cent. There were 49 non-operated cases with 19 recoveries, or 38 per cent.

From his study of the subject Brindeau concludes that old adnexal infections do not always prevent impregnation. Such old healed lesions do not as a rule cause complications either during pregnancy or the puerperium.

In certain cases however old salpingo-ovarites, especially if acute or subacute, may cause more or less severe complications during pregnancy. Some of these are purely mechanical: pains, adhesions, uterine deviations, torsions of the tube, ectopic gestation. The septic complications are more important, and are usually produced at the beginning of the pregnancy (31 per cent of the cases), or at the end, or during the puerperium. An abortion or labor may provoke this septic complication which consists either in inflammation of the adnexæ or of the periuterine cellular tissue or in a generalized peritonitis. Such a peritonitis is often fatal.

Treatment of these different complications should be surgical and as early as possible during the pregnancy in order to save the mother and to permit the pregnancy to go to term safely. If the woman has expelled the ovum she should be treated as if it were a complication arising during the puerperium. When infection appears to be localized a watchful preparedness should be adopted, giving way to intervention later; but if the symptoms are of a generalized peritonitis the action should be at once. Laparotomy alone will permit the saving of some women otherwise doomed to death.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Copeland, G. G.: Nitrous Oxide-Oxygen Analgesia and Anæsthesia in Obstetrics. *Canad. M. Ass. J.*, 1917, vii, 405.

Copeland states that a normal woman having a normal labor needs nothing except chloroform or ether. In cases with a rigid or spastic cervix, morphine, chloral, hyoscine, ethyl chloride, ether, or chloroform are more relaxing. In other than normal cases, he believes that nitrous-oxide oxygen approaches the ideal anæsthetic if properly administered. The perineal stage of labor requires an expert anæsthetist, also either ether alone or a mixture of gas and ether.

Attention is called to the advantage in deliveries with danger of asphyxia as in a breech presentation or before the mucus is removed, of giving oxygen to the mother.

W. F. HEWITT.

PUERPERIUM AND ITS COMPLICATIONS

Kay, R.: Puerperal Fever Treated by Vaccine. *Brit. M. J.*, 1917, i, 221.

The author reports the case of a young primipara who, during confinement, suffered a considerable tear of the perineum. The placenta was long in coming and was incomplete. After the child was born the patient complained of faintness, was pale and restless and had sighing respiration. She then passed a large clot and the rest of the placenta: the uterus contracted satisfactorily, was douched, and pituitary extract was administered. Twelve hours later the patient rallied; she was warm, her pulse was 120, and the temperature normal. She had an angry blister, the size of half a crown, on the left buttock, three or four inches from the vagina, and stated that she had felt some discomfort there for several days. To this the author attributes the fever which followed.

The next day the temperature was rising, and the perineal tear looked sloughy: after cauterizing the perineal tear with phenol the author explored the uterus again. He found nothing, but caused a rigor. Next day, as the patient was obviously worse, the author injected antistreptococcus serum, with excellent results, for a few days; the pulse came down to about 100, and the patient was indomitably cheerful. She then developed a slight cough, and, ten days after the injection an urticarial serum rash appeared. The perineal tear was clean, there was a slight discharge from the cervix, but no smell; the blister was still angry and painful. The urticaria disappeared, but the morning temperature remained high, and the pulse began to rise above 100. A swab, used through a Fergusson speculum, apparently caused a considerable increase in the fever.

On the twentieth day of the illness the patient developed a third rash which was measly in type and doubtless septic. Next day the patient became delirious, and the Clinical Research Association

reported that a few streptococci had developed and that they were sending a stock vaccine at once. The marvelous result of that stock vaccine, after a slight negative phase, is shown by a chart. The patient had a crisis (drop from 103.8 to 98.4), and was well. The cough, never troublesome, cleared up. Only the obstinate sore on the buttock remained, and when the autogenous vaccine arrived and was injected, that cleared up at once: evidently the vaccine was specific as regards the blister.

P. G. SKILLERN, JR.

MISCELLANEOUS

Morriss, W. H.: The Obstetrical Significance of the Blood-Sugar with Special Reference to the Placental Interchange. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 140.

Blood-sugar estimations were begun in the Laboratory of the Yale Medical School as part of a plan to study the problem of the placental interchange by systematic comparison of the various constituents of the blood of the mother and her newborn infant. It soon became apparent that analysis of the mother's blood was required not only at the conclusion of labor but also during the periods preceding and following the infant's birth. And finally, observations were made upon pathological cases.

Before the specimen for analysis was secured, the patient had fasted for at least three hours, a period which Hopkins and Graham found sufficient to eliminate errors due to alimentary glycosuria. The analytical method of Lewis and Benedict was adopted; for as the author states this has been widely used and has proved to yield consistent results. Since its initial step—dilution of the blood with water—insured thorough hæmolysis, the estimation includes the sugar in both corpuscles and plasma. Essentially, the subsequent steps are precipitation of the blood-proteins with picric acid, filtration and, after further addition of picric acid and sodium carbonate to the filtrate, the development of a red color by careful heating. The chemical reaction involved is the reduction of picric to picramic acid by glucose. Comparison of the color obtained with that of a standardized solution of picramic acid determines the amount of sugar in the blood. From his study the author draws the following conclusions:

1. Normal blood-sugar values (0.09–0.11 per cent) prevailed during pregnancy and the puerperium.

2. During the early part of labor the values were normal, but in the second stage the blood-sugar was increased. In 28 cases at the moment of birth the average maternal blood-sugar was 0.132 per cent.

3. The rise in the blood-sugar was partly due to the mother's voluntary efforts to expel the fœtus, and it was accentuated by the use of an anæsthetic.

4. At the moment of birth the foetal blood-sugar was lower than the maternal. In 24 normal cases, in most of which an anæsthetic was used, the average foetal value was 0.115 per cent.

5. The concentration of glucose in the two circulations was such that the placental interchange may readily be explained, the author believes, by the process of diffusion; and the lower concentration in the foetal blood assures a flow of glucose from mother to foetus.

6. After obstetrical operations higher values were found for the blood-sugar in both mother and foetus, and were explained by the influence of the anæsthetic.

7. Normal blood-sugar values prevailed in pre-eclamptic toxæmia, though a rise occurred just after a convulsion. Also after repeated convulsions or with pronounced renal involvement the percentage of blood-sugar was notably increased.

GEORGE E. BEILBY.

Plass, E. D.: Placental Transmission: Creatinin and Creatin in the Whole Blood and Plasma of Mother and Foetus. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 137.

The recently developed methods for the quantitative determination of various constituents of normal blood have stimulated the study of the placental transmission of these substances with the hope of deducing some general principles involved in this reciprocal exchange which is so essential to the foetal economy. The author believes that the relative concentration of a given substance in simultaneously collected samples of maternal and foetal blood should throw some light upon the method of interchange between the two circulations. In the present work the blood samples were collected as nearly simultaneously as possible and the analyses were begun at the earliest possible moment.

In the course of their work the author discovered that by hæmolyzing the blood before saturating

it with picric acid higher values for both fractions were obtained. The greater hæmatocrit value of foetal blood was already known. A second series of determinations was then made, blood hæmolyzed by the addition of four volumes of distilled water, as suggested by Myers, being employed. The hæmatocrit values were obtained by centrifugalizing the undiluted whole blood in 15 cubic centimeter graduated centrifuge tubes for 20 minutes at 3,000 to 3,500 revolutions per minute. Satisfactorily pure picric acid was used and the colorimeter readings were corrected by a table similar to that published by Hunter and Campbell.

The results in general showed less agreement between the two bloods than did the first series. The preformed creatinin varied in an inexplicable manner, and, while the total creatinin roughly paralleled the hæmatocrit values, the relation was so inaccurate that no conclusions could be drawn regarding the comparative concentrations of the two constituents in the bloods.

Simultaneously collected samples of maternal and foetal blood were analyzed by the author for preformed and total creatinin by Folin's method. The determinations on unhæmolyzed and hæmolyzed whole bloods brought out no definite information with regard to the exchange between mother and child, but when serum or plasma was used, a definite relation was clearly established. The concentration of both fractions was the same under normal conditions in the plasmas which are naturally the fluids concerned in the placental interchange.

The use of serum or plasma was essential in the study of placental transmission.

The plasmas of both mother and child contained the same amounts of preformed and total creatinin. The values were the same as those found in non-pregnant women.

The preformed and total creatinin apparently passed between the mother and foetus by simple diffusion.

GEORGE E. BEILBY.

GENITO-URINARY SURGERY

KIDNEY AND URETER

Blaine, E. S.: Renal and Ureteral Stone Symptoms in Spondylitis. *Am. J. Roentgenol.*, 1917, iv, 122.

Blaine analyzed a number of cases diagnosed as renal and urethral stone but which were negative to X-ray as no shadows indicating stone could be found. He found that a majority showed osseous changes involving the edges of the bodies of the lumbar vertebrae, and as these bones are in close contact with the kidney and upper portions of the ureters, so in considering a case with symptoms of renal stone in which the roentgen examination does not show stone shadows but osseous change in the lumbar bone, it should be assumed that the latter condition may be the cause of the pain as well as the other symptoms that are more or less characteristic of stone.

J. G. BURKE.

Childs, S. B.: Stone Casts of the Renal Pelvis and Calices; Roentgen Findings in Seven Cases with Their Clinical Histories. *Interst. M. J.*, 1917, xxiv, 354.

The author, after recapitulating the known theories of the formation of stone in the kidney, endeavors to show that renal stone casts have not the same origin, but arise from lesions of the mucous membrane (probably due to infective organisms) in the calices and pelvis. These deposits, arising from various centers, according to his ideas, when large enough, fuse together. In proof of these ideas, in his seven cases, a large number were symptomless. Infection was proven in every case, and in one case in particular the infection was proven to precede the formation of stone. Rather significant is the fact that tuberculous infection of the kidney existed in a large number of these cases.

Again, although bilateral stone is not uncommon, in this series of cases, bilateral casts were found in the majority of cases.

The author accounts for a separation of a cast of one of the calices from the main cast, not, as has been said, by the fact that a fracture has occurred, but by the supposition that union has not occurred.

His conclusions are as follows:

1. Bilateral stone casts in this series of cases occur in 57 per cent—a much higher per cent than has been found reported in the cases in which the ordinary calculus has been demonstrated bilaterally.

2. The majority of these cases were free from renal colic, and never had any definite sharp pain referred to the affected kidney or kidneys.

3. Infection is present in every one of these series of cases; it is impossible to say whether the infection preceded the formation of the stone cast

or vice versa, but in one case a definite infection of the right kidney pelvis was demonstrated prior to the formation of the cast.

4. Tuberculous infection of the affected kidney was present in three of the seven cases, or more than 42 per cent.

5. Evidence is present to show that these stone casts are formed in a different manner from the ordinary renal calculus, even though the method of formation of each is not definitely known.

6. What has heretofore been reported as a fracture of large stones is probably a failure of union of discrete portions of a stone cast.

W. M. SPITZER.

Hagner, F. R.: Bilateral Polycystic Kidney. *Ann. Surg.*, Phila., 1917, lxxv, 580.

Hagner reports a case of bilateral polycystic kidney in which life was prolonged by puncture of the cysts. He briefly reviews the supposed causes of this condition, and emphasizes the fact that it is always bilateral, and that Lund's puncture operation is the only permissible procedure.

FAXTON E. GARDNER.

Barney, J. D.: The Influence of the Venous Colateral Circulation of the Kidney on Hydro-nephrosis. *Ann. Surg.*, Phila., 1917, lxxv, 597.

Barney has shown experimentally that complete and sudden obstruction of one ureter by ligation results in hydronephrosis of the corresponding kidney, and that with few exceptions, the degree of hydronephrosis varies directly with the length of time after ligation of the ureter.

It became apparent to the author that when the venous plexus was absent or poorly developed, there was generally a correspondingly small hydronephrosis; that when the venous apparatus both in the fat capsule and on the surface of the kidney was well developed, the anastomoses would take up the work for which they were intended and carry on, more or less perfectly, the venous circulation of the kidney. If, on the other hand, as may occasionally happen, this accessory venous circulation develops either not at all or but slowly, the secretion of urine soon ceases, hydronephrosis will not develop, and atrophy of the kidney will take place.

It occurred to Barney that if true renal atrophy would take place spontaneously it might also be produced artificially by preventing the formation of the venous anastomosis.

The laboratory notes and technique of the operations on the four dogs is given. On two dogs the ureter was divided about two inches below

the kidney between two ligatures. The spermatic vein close to its entrance to the vena cava, a small group of veins at the lower pole of the kidney, the suprarenal vein, and a group of two or three lumbar veins posterior to the kidney were ligated and tied. These two dogs developed atrophy.

The same technique was followed on two other dogs, but the veins were not ligated. These dogs showed the typical appearances of hydronephrosis.

Barney's conclusions from these observations are:

1. Sudden, complete, and permanent obstruction of one ureter produces hydronephrosis in animals in the vast majority of cases.

2. Atrophy of the kidney may develop in rare instances.

3. When hydronephrosis occurs the venous collaterals of the kidney are well developed; when atrophy of the kidney takes place it is due to a lack of development of these collaterals.

4. Atrophy of the kidney may be produced experimentally, by simultaneous ligation of the ureter and of the veins which maintain the collateral venous circulation of the kidney.

5. When the obstruction of the ureter is partial or intermittent the hydronephrosis is of greater size than when the obstruction is complete, sudden, and permanent, for in the latter event, urinary secretion ceases before the venous collateral circulation has time to develop.

LOUIS GROSS.

Thomas, B. A., and Birdsall, J. C.: An Unusual Case of Renal Tuberculosis. *Ann. Surg., Phila.*, 1917, lxx., 602.

The authors state that the possibility, by virtue of X-ray revelations, of confusing renal and ureteral tuberculosis with calculus of the kidney or ureter is well known to urologists and roentgenologists, but the error of mistaking a calcified plaque in the internal iliac artery for a ureteral calculus, which subsequently proved at operation to be a renoureteral tuberculosis without calcification, is novel if not an excusable diagnostic blunder.

The patient was a man of sixty-two, whose complaint was attacks of frequency and burning on urination, associated with pain in the back. Cystoscopy revealed the bladder to be the seat of low-grade inflammation, more marked at the trigone. Indigo-carmin showed elimination of the dye from the right ureteral orifice within normal time limits, but no elimination from the left ureter for over twenty minutes, in fact no function at all was visible on the part of the left ureter. An attempt to insert a skiagraphic catheter in the left ureter was frustrated by a definite obstruction 2.5 centimeters above the orifice. Skiagraphic plates showed a shadow the size of a pea in the region of the lower left ureter. Operation was undertaken for removal of calculus in the lower portion of the left ureter. On operation, a small hard mass was encountered in the region of the internal iliac artery, and exposure and palpation revealed a calcified plaque just below the bifurcation of the common iliac

artery. The kidney was found to be mildly lobulated; the ureter was severed by cautery and the kidney and ureter removed *in toto*. Examination showed caseous cavernous renal tuberculosis, the entire ureter being also involved.

The authors present the following points of interest in their postoperative review:

1. A strictured or almost completely closed tuberculous ureter which by virtue of the correlation of the X-ray shadow and the level at which the catheter was obstructed permitted the diagnosis of ureteral calculus.

2. An abscess of the suprarenal gland associated with the renal tuberculosis, but with no manifestation of Addison's disease.

LOUIS GROSS.

Séres, M.: Nephrectomy in Renal Tuberculosis (La nefrectomia en la tuberculosis renal). *Rev. méd. de Sevilla*, 1916, xxxv, 309.

The author reports 12 cases of renal tuberculosis in which, after the usual functional tests, he executed nephrectomy. There was one death due to nephritis. The average mortality in the cases of leading operators as quoted is 1 in 14.

W. A. BRENNAN.

Moffitt, H. C.: Tumors of the Kidney. *Calif. St. J. Med.*, 1917, xv, 246.

Moffitt insists that clinical diagnosis must be based upon a good history, careful observation, and proper correlation of facts, and in discussing tumors of the kidney emphasizes the importance of symptomatology, the differential diagnosis of the growth from that of some other organ, and the weighing of certain general and distant signs.

He finds bleeding, a common and often the first symptom, occurs frequently without cause, but may follow exertion or trauma, that the small worm-like dots, regarded as characteristic, are most often absent and may occur from other causes. Occasionally a history of hæmaturia in abdominal tumors not of kidney origin is obtained, but the occurrence is rare, and, in a doubtful case, hæmaturia should decide almost certainly for kidney neoplasm. Microscopic blood in the urine is of much less significance than frank bleeding; large, irregular polymorphous cells are found at times, but, apart from hæmaturia, the findings in the urine are not usually important.

Moffitt has found that pain in the testicle has been so persistent as to lead to castration without recognition of the renal tumor, that the areas of hyperalgesia of Head have been of no assistance, and that any distant pain should awaken suspicion of metastases. He also affirms that the pain of hydro- or pyonephrosis or of renal neoplasm may frequently be referred to the epigastrium and lower abdomen and, when associated with anorexia, vomiting, flatulence, and distention, is falsely interpreted as meaning stomach, gall-bladder, appendix, or pelvic disease. Polyuria and bladder symptoms may occur with neoplasm as with other renal disease, but they are rarely of importance.

The author emphasizes the importance of repeated examinations as an abdomen may be difficult to palpate one day and easy the next, and it may be of advantage in the detection of small tumors, to have the patient half sitting, or turned on the side with trunk and thighs bent toward each other; hot poulticing or a hot bath greatly helps to relax muscles. In tumors that cannot be palpated and in small tumors of doubtful renal origin, diagnosis must be based upon cystoscopic examination, determination of renal function, and pyelography. Of greatest importance in the recognition of renal neoplasms is the fact that no matter how great the enlargement or what its nature may be the rounded kidney shape is more or less preserved. Ballottement from the flank is important although it may be absent in fixed kidney tumors, and may be demonstrated at times in tumors of the liver, spleen, and colon. Pulsation of a tumor should suggest hypernephroma, but it may occur in aneurism or retroperitoneal sarcoma. Moffitt also states that the fact that tumors of the kidney lie deep in the flank, and in their growth carry the colon in front of them, is important in diagnosis, but absolute reliance must not be placed upon this sign as he had wrongly ruled out a tumor of the kidney, and called the mass spleen because the colon lay wholly along the anterior border.

A low anchored kidney has been diagnosed as a kidney tumor, when it was only a plump right liver lobe, the mistake occurring from pressure on the renal pelvis causing an abnormal pyelograph; likewise a tilted liver or abnormally shaped or thick right lobes have caused the same mistake. It is well to bear in mind the fact that at times an enlargement of the liver, from dislocation and engorgement is not uncommon in hypernephromata.

As a rule an enlarged spleen is easily recognized but sometimes enlarged spleens are plump, unduly movable from the flank, and lie deeply, or become tilted forward so that the edge is no longer readily felt; the vertically placed, elongated, rounded spleens, with nearly parallel borders are the most confusing. Apart from leukæmia, splenic tumors are usually associated with leukopenia, while renal tumors, especially sarcomata, may cause high polynuclear leucocytosis.

In tumors of the colon, the important signs in diagnosis are history, X-ray plates, melæna, and occult blood.

Retroperitoneal tumors are usually less movable by ballottement, cause the same pain radiation, but none that Moffitt has seen have caused hæmaturia. Functional tests and pyelography are of great value in diagnosis.

Among the general or distant signs, the author has observed pigmentation, gigantism, precocious sexual development, hypertrichosis in children, arteriosclerosis in a boy of fourteen years, frequently metastases, varicocele in five cases of hypernephroma and herpes zoster in the distribution of the third and fourth lumbar nerve-roots.

LOUIS GROSS.

Bartlett, W.: A New Operation for Movable Kidney.
Tr. Am. M. Ass., N. Y., 1917, June.

The author reviews the methods which have been proposed for the surgical treatment of movable kidney, and finds that the suspension principle underlies all of them. He proposes an operation which is intended to support the organ from below by the physiologic use of the patient's own fat. The operation consists of six steps: (1) An incision is made, bisecting the angle formed by the last rib and the erector-spinae muscle; (2) the fat is stripped from the inside of the lumbar muscle; (3) the fatty capsule of the kidney is stripped off except at its attachment around the hilum and is completely inverted as the kidney is lifted out of the wound; (4) this fat is transformed into a ball by catgut sutures; (5) this ball is drawn down into the defect into which the kidney formerly slid, and anchored to the inner surface of the abdominal wall just below the incision; (6) the wound is completely closed without drainage.

In this manner a threefold purpose is accomplished. The self-lubricating jointlike bag in which the kidney slid about is completely removed: the organ is held up in a new, high position by the ball of fat, and adhesions are allowed to form between the exposed muscles of the abdominal wall and the kidney.

The author has performed this operation on twenty patients and in every instance the kidney has remained in place. The functional results have been most gratifying as late as five years after the operation.

Pirondini, E.: Experimental Contribution to the Study of Hæmatogenous Kidney Infections
(Contributo sperimentale allo studio delle infezioni renalematogene). *Sperimentale*, Firenze, 1917, lxx, 551.

It is clinically demonstrated that the principal conditions which favor the growth of microbes in the kidney substance are: trauma, renal mobility, calculi, and hydronephrosis, all of which cause trouble by circulatory disturbance and retention of urine, which in turn alters the circulation of the blood.

The author reports the results of fifty experiments made on dogs to study these elementary conditions and to clear up points on which many authors disagree. The experiments were carried out under the following headings: (1) kidney contusions; (2) strangulation of one kidney pole; (3) ligation of one branch of the renal vein or renal artery; (4) embolism of a renal artery or of one of its branches; (5) hydronephrosis by Papin's method.

As the results of this experimental work Pirondini reaches these conclusions:

1. It is possible to produce hæmatogenous renal infections in dogs experimentally by causing a bacteræmia and at the same time a debility in one or both kidneys. Such results are, however, at least in the dog, very difficult to secure, principally perhaps because human germs do not always have the same effect in dogs as in man. That such a

diversity of action does exist is well-established, since with human staphylococci furunculi can be produced in the dog. But often it happens that with germs obtained from one dog and inoculated in another hæmatogenous renal infection is not obtained. The greatest difficulty consists in finding what grade of virulence and toxicity of germs is most suitable. As a general rule the probability of obtaining positive results is better according as the conditions surpass those in human pathology. Thus by causing a local infection renal infection is obtained with more difficulty than by effecting a direct bacteræmia by introducing germs into the external jugular vein. Hence the experimental results and deductions are not exactly applicable and comparable with human pathological conditions.

2. Experimentally, of the various factors which favor the growth of circulating germs in the kidney, slowing of the urinary current is of the greatest importance. By associating bacteræmia and deviation of the first portion of the ureter by Papin's method positive results are obtained with very great relative frequency, considering only those in which infection is evident and completely unilateral. Contusion gives positive results with much less frequency. Altering conditions by other means (strangulation of a pole, ligature of a renal vessel, etc.) the results obtained are generally less important.

The kidney may become spontaneously infected similarly to other organs (spleen, lung), which demonstrates that infection of the experimentally debilitated kidney may be quite independent of the produced debility itself.

3. In hæmatogenous renal infections produced experimentally the same gross anatomic alterations are found as in human pathology. The infarcts, however, do not always have the characteristic cortical situation, and the typical disposition at the periphery. In harmony with human pathology in some experiments and especially in those with local arterial embolism there is an evident tendency to the secondary formation of a perirenal abscess.

The histologic alterations are also very similar to those of human pathology. Generally, however, in experimental renal hæmatogenous infections, the histologic alterations show a greater limitation. In agreement with the experimental results obtained by Rehn there is frequently noted a tendency to bacterial invasion of the fibrous capsule and the perirenal connective tissues.

Sometimes the control kidney at gross examination appears quite normal; but histologic examination shows recent alterations of the same type as in the involved kidney. It may be doubtful in such a case if the alterations in the control kidney are purely toxic, and bacterial research does not give positive results. Such facts increase the complexity which the interpretation of the results obtained present.

W. A. BRENNAN.

Kolischer, G.: Notes on Indications in Kidney Surgery. *Ann. Surg., Phila.*, 1917, lxxv, 573.

In no other field of kidney surgery is it so important to be careful as to operative indications as in floating kidney. Nephropexy should be performed only when it is evident that the symptoms are directly due to the abnormal mobility of the kidney, and are not relieved by rest or other therapeutic measures. Rash promises for a complete cure should not be made.

A diagnosis of stone in the kidney is equivalent to a formal indication of removal. The question is, which is better, immediate interference or postponement on account of the patient's general condition. On the other hand ureterotomy for stone should be restricted to the most cogent indications, chiefly reflex anuria or urinary sepsis. Many ureteral stones are passed spontaneously or with the help of cystoscopic manipulations.

Bacterial invasion of the kidney becomes a subject of surgical attention as soon as an inflammatory involvement of the parenchyma is recognized. There may be some discussion as to the time and extent of the operative interference but it cannot be gainsaid that cases recovering spontaneously are in the minority. Some cases will allow waiting till the acute process is over and the immunity greater; others will not. Symptoms pointing to a rapid process are a constant rise in the temperature, repeated chills, and the appearance of blood with pus in the urine. Sudden stoppage of the hæmorrhage once it has set in is also a danger signal, meaning, as it does, the blocking of the ureter by a clot and subsequent retrodistention of the kidney parenchyma.

Stormy renal infections are usually due to the colon bacillus or to the staphylococcus. Streptococcus invasion leads to hard infiltration of the parenchyma, with symptoms of acute nephritis, negligible pus formation, and hæmorrhage of an occult character. Such streptococcic nephritis calls for immediate nephrectomy or nephrotomy, blindness and death being the only other alternative.

The results of decapsulation in chronic nephritis are somewhat conflicting and indications uncertain. If after the kidney has been exposed, intrarenal pressure seems to be high, a favorable result may be expected from decapsulation.

FAXTON E. GARDNER.

Buerger, L.: Stenosis and Stricture of Ureter. *N. Y. M. J.*, 1917, cv., 826.

Buerger gives a brief résumé of some of his own observations on stenosis and stricture of the ureter with several case histories of interest. His own cases may be classified as the congenital and acquired varieties.

Most congenital stenoses belong to one of two classes: those in which there is a narrowing at or very near the ureteropelvic junction, and those in which there is stenosis, atresia, or maldevelopment of the lower end of the ureter.

The author has operated upon several patients whose condition belonged to this category, and has studied the pathological specimens. As a rule, he deals with a congenital aplasia of the ureteropelvic junction. The uppermost portion of the ureter has the diameter of a small probe or larger, at most two to four millimeters in diameter and the ureteral lumen is commensurately diminished, permitting at times the forcible introduction of a fine probe, but, strange to say, being sufficiently narrow to prevent the contents of the kidney from flowing through the ureter. When these cases come to operation, there is usually an enormous hydronephrosis with thin membranous walls.

Clinically, experience teaches that this condition is apt to exist for years until an enormous hydronephrosis develops, and that the symptoms may be absent until the tumor has attained such size that it gives signs of its presence merely by its weight, size, and pressure effects. Sometimes, however, there is an associated inflammatory process, as in a patient operated upon by him, where the perinephritic inflammation altered the clinical picture.

In another class of cases the lower end of the ureter is concerned, and these may be subdivided as follows: (1) total aplasia of the lower end of the ureter with complete absence of a portion of the ureter without any visible indication of ureteral meatus in the bladder; (2) atresia or aplasia of the lower end of the ureter with distinct indication of the presence of an orifice; (3) congenital narrowing of the lower end of the ureter; and (4) narrowing of the lower end of the ureter with prolapse and cystic dilatation of the intravesical part of the ureter, or ureterocele.

When this condition has been present for years, and when the stenosis is still more marked, a veritable pyriform tumor, called ureterocele or cystic dilatation of the lower end of the ureter, may be produced.

If the stenoses due to tuberculous inflammation are left out of consideration, Buerger classifies his cases as follows: (1) the traumatic cases, usually postoperative; (2) those due to inflammation, particularly periureteral inflammation; (3) those associated with calculus; and (4) cases dependent upon gonorrhoeal inflammation.

Most of the traumatic strictures are directly traceable to previous ureterotomy for impacted calculus; a few follow hysterectomy and reimplantation of the ureter after resections of the bladder. Whenever infection takes place, even of mild degree, after ureterotomy, or when a hematoma forms, particularly in cases in which a considerable ureteritis and periureteritis had already existed at the time of the ureterotomy, or whenever the ureter has suffered considerable handling at the time of operation, subsequent narrowing or even complete stricture of the ureter may take place.

In the category of inflammatory stenoses belong those that may be attributed to an inflammatory lesion of the wall of the ureter itself, or that result

by virtue of a periureteral inflammation. Although renal lithiasis may complicate these conditions and a history of an attack of ureteral or renal calculi may be elicited, a careful study of the pathology reveals no direct relationship between the descent of a calculus and the stenotic condition of the ureter. Buerger believes that there are coarctations independent of the presence of calculi.

A most interesting type of ureteral stenosis is that produced by the growth of inflammatory fatty tissue, either about the ureter alone, or around the pelvis of the kidney, the ureter, and the ureteropelvic junction.

Another type of inflammatory stricture of the upper part of the ureter in which, however, the possibility of a calculus as the cause could not be excluded, was recently observed in a man who had consulted the author for a large perinephritic exudate. A stricture in the upper portion of the ureter about 21 centimeters from the ureteral orifice in the bladder had led to hydronephrosis, distention of the pelvis and upper ureter, perforation of the pelvis, periureteral inflammation, and a perinephritic abscess containing urine and pus.

The ureteral lesions produced by the lodgment or impaction of extensive ureteral calculi are well known. Buerger describes a specimen obtained from a patient in whom an excellent example of spontaneous exclusion of the kidney was produced by stenosis of the upper end of the ureter, a lesion resulting from the traumatic influence of ureteral calculi.

On opening the kidney, the pelvis was seen to form the central portion of the interior of the sac, the picture being that of a typical hydronephrosis of long standing where practically not a vestige of renal tissue was left. Just outside of the pelvis there were masses of fat such as usually accompany inflamed and pyonephrotic kidneys. In the lowermost pole of the kidney in one of the pockets there was an irregular quadrilateral stone measuring 11 millimeters in diameter.

The ureter was embedded in a mass of fat and connective tissue, being a cord about 3.5 centimeters in diameter. On being opened, its walls were found to be considerably thickened, intimately adherent to the surrounding fat, and everywhere dilated to four times the normal size.

The ureteropelvic junction was anomalously placed, being considerably lower than normal, as if it arose at the lowest pole of the kidney. Here it was difficult to find the ureter because of the surrounding fat and its small size. In this region its diameter was reduced to that of a fine probe, and its lumen was in places less than one millimeter in diameter. At a point just below the pelvis, the lumen was absent, the ureter being impervious.

As for gonorrhoeal stricture, Buerger's data are meager. In a case recently observed and reported of a young man who had had an intractable gonorrhoea for many months, the gonorrhoeal process had extended into the lower end of the ureter. With

the ureteral catheter, Buerger encountered a stricture of the lower portion of the ureter, was able to overcome the obstruction and demonstrate the presence of retention of urine in the kidney, the collected specimens yielding pure cultures of gonococci.

Macht, D. I.: The Pharmacology of the Ureter; Action of Hydrastin, Hydrastinin, Cotarnin, Emetin, and Some Pyridin Derivatives, with a Further Analysis of the Opium Action. *J. Pharmacol. & Exp. Therap.*, 1917, ix, 287.

In the present paper the author describes the action on the ureter of the alkaloids hydrastin, hydrastinin, cotarnin, emetin, and some derivatives of pyridin, the behavior of which substances is not only interesting in itself but also makes it possible to further analyze the action of the opium alkaloids.

Hydrastin itself, and its hydrochloride, quickly inhibited ureteral contractions and lowered the tonus, even when administered in small doses. Hydrastinin itself, and its hydrochloride, on the contrary, did not inhibit the ureteral contractions when used in small doses (1 to 5 mg.), and actually stimulated them and increased the tonus when given in larger doses (5 to 10 mg. in 25 cc., Locke).

From his investigations the author divides the opium alkaloids, in respect to their action on the ureter, into two classes. On the one hand is the benzyl-isoquinoline group, of which papaverin is the chief representative and which caused inhibition of the contractions and lowering of tonus. This effect was shown to be due to the benzyl component of the molecule and not to the isoquinoline component. The inhibitory action was further shown to be produced by the unoxidized benzyl group and not by oxidized acidic radicles.

Although the observations reported by the author were made on the ureter, he believes that the same conclusions hold good for other smooth-muscle structures, as for instance, the uterus, and experiments along these lines are now being made.

The author calls particular attention to the importance of experimenting with definite chemical substances in pharmacological research, which is well illustrated by the behavior of hydrastin and hydrastinin. For instance, he states, when an author reports experiments with the fluid extract of ergot (the alcohol not having been removed) on the vas deferens, or with the tincture of hydrastis (the alcohol not having been removed) on the uterus masculinis the observations are of a purely empirical nature and give very little insight into the pharmacological properties of the active principles contained in the crude drugs.

Hydrastin and emetin exerted a papaverin-like action on the ureter, inhibiting its contractions and relaxing its tonus.

Hydrastinin and cotarnin exerted a morphine-like action on the ureter, stimulating its contractions and increasing its tonus.

Piperidin hydrochloride, and arecolin and co-

tarnin produced a stimulation of the ureteral contractions and an increase in its tonus.

These observations with a large number of experiments on opium alkaloids led the author to a general hypothesis that the inhibitory action of the papaverin group of opium alkaloids on the ureter was due to their benzyl constituent, and that the stimulating action of the morphine group was due to their piperidin constituent.

GEORGE E. BEILBY.

Jackson, W. R.: Some Problems of Ureteral Surgery. *N. Y. M. J.*, 1917, cv, 639.

The accidents of surgery often cause grave concern. Injury to the ureter during hysterectomy, either by cutting, bruising, or lacerating, frequently is very troublesome, and may be dealt with by the following methods: (1) anastomosis (Bovee, Poggi-Robson, Van Hook); (2) implantation into the bladder (Boari, Witzel, transperitoneal, extra-peritoneal); (3) implantation into the intestines (with and without flap or valve); (4) anchoring the ureter externally on the skin (lumbar or abdominal); (5) double ligation of ureter *in situ*.

Injuries near the bladder are best dealt with by vesical implantation or anastomosis, but injuries higher up may demand implantation into the rectum, colon, or sigmoid, or ligation, or anchoring the ureter externally, and later performing nephrectomy. Many cases are recorded where simple single ligation of the ureter has been successful. When the ureter is ligated, the function of the kidney ceases when the urinary pressure in the pelvis of the kidney is equal to the blood-pressure in the vessels of the kidney.

Kidney tissue may remain quiescent for years and when the pressure is removed, activity of the glomeruli is immediately established, as seen in old cases of hydronephrosis.

If the ligature of the ureter is applied too tightly it will cut through the walls of the ureter and a urinary fistula will soon follow, the urine, of course, traveling along the lines of least resistance.

Double ligature of large size gut lightly applied will not sever the walls and will insure fibrous obliteration of the ureteral lumen.

A point of the technique is to cover the area of anastomosis with a cuff of peritoneum or a strip of omentum. Fine silk on a round curved needle is used for the ureteral suture. Drainage with rubber tissue is used preferably.

The conclusions are:

1. Injuries to the ureter during hysterectomy are more frequent than is perceived at the time of operation.
2. Discovery of the injury to the ureter is more often made after the operation than at the time of it.
3. Difficulties of repairing the injured ureter are greater than they seem.
4. Injury to the ureter during a hysterectomy often means the sacrifice of the kidney, and sometimes the death of the patient.

5. It is better not to attempt to repair a ureter if there is serious doubt of its accomplishment. Attempts at repair by experts often result disastrously. Removal of the kidney would be better.

6. A kidney should not be removed to cure a leaking ureter until one is sure of the presence of a perfectly sound kidney on the opposite side.

7. Ligation (double) is better than removing the kidney, because the hormones of the crippled kidney aid in renal secretion of the other one.

8. Implantation of the ureter into the bladder often leads to renal infection by the urine being dammed back into the pelvis of the kidney. Intestinal implantation is more likely to be followed by colon infection, in fact, the rule is invariable pyonephrosis.

Fleischhauer, H.: Tying the Ureter when It is Impossible to Transplant It. *Zentralbl. f. Gynaek.*, 1917, No. 23.

In gynecologic intervention section of the ureter is not a rare accident, and when it occurs the ideal treatment is the implantation of the proximal ureteral stump in the bladder. When this is not possible, other methods must be used, such as intestinal implantation, suture of the ureter, etc., since abandonment of the injured ureter is not compatible with life.

Kasowoye experimentally tied the ureteral stump as is done with the umbilical cord with success. Stoechel attempted this clinically but without success, the patient dying of generalized sepsis. However, the tying of the ureter was successful insofar as there was no urinary infiltration.

Fleischhauer reports an attempt made in the case of a woman who during a Wertheim operation had a ureter accidentally sectioned. This was twice tied and the woman survived. Naturally in such cases the related kidney progresses to atrophy or hydronephrosis; the latter first. W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Beer, E.: The Surgical Therapy of Benign and Malignant Tumors of the Urinary Bladder. *J. Am. M. Ass.*, 1917, lxxviii, 680.

The author considers the subject from the standpoint of surgical therapy and divides the tumors into three groups as follows:

1. Benign papillomata, including single and multiple recurrences and papillomatosis. These, with the exception of the latter condition are successfully treated by high-frequency cauterization. There may be exceptions with single or multiple tumors where the treatment cannot be carried out owing to hæmorrhage, inaccessibility of the growth, or an intolerant patient. The author has observed permanent cures for a period of six years.

In papillomatosis, endovesical therapy is not rapid enough and here extraperitoneal suprapubic operation must be performed. To insure against implantation of tumor tissue the greatest gentleness

is necessary. The bladder should not be filled before operation and should be drawn out of the abdomen by its urachal end. Thorough protection with gauze packings must be made before opening the bladder. A small incision is first made and each papilloma destroyed with the Paquelin cautery as it comes into view, the incision being gradually lengthened until the whole interior can be surveyed. Large pedunculated papillomata may be seized with a blunt ring clamp and seared off at the pedicle. Destruction of the papillomata being completed, the incision is cauterized and, to destroy any broken off fragments, the whole field is bathed in alcohol for several minutes, the operation being completed in the usual manner.

2. In the second group are papillomata which respond poorly or slowly to high-frequency cauterization or which under the microscope are suggestive of malignancy. The author favors the open suprapubic operation in these cases since high-frequency cauterization has been a disappointment. Exception may be made in cases which appear by cystoscopy to be benign papilloma and, after removal of a piece for microscopical examination, the growth is thoroughly cauterized and later, although the microscope indicates malignancy, the growth is found at subsequent examinations to have been thoroughly destroyed by the high-frequency current. The author believes that thorough cauterization of the base is all that is needed in these cases where the malignant change is apparently only superficial.

3. In the third group are papillary carcinomata and other types of malignant disease infiltrating the bladder wall. Here partial or total cystectomy must be performed. The author restricts the use of the transperitoneal route to tumors of the posterior wall of the bladder involving the peritoneum. In others he prefers the extraperitoneal technique. He believes that owing to diminished resistance due to the disease as well as a possible cystitis or an interstitial nephritis, the patient is more susceptible to peritonitis. Tumors of the lateral or anterior walls or the ureteral regions may be removed by partial cystectomy. For tumors of the neck and trigone or for multiple malignant growths, he prefers total cystectomy including the upper third of the prostate, pelvic fat and lymphatics, seminal vesicles, etc., with iliac implantation of the ureters. Partial cystectomy is performed with the Paquelin cautery. The same precautions as regards transplantation, walling off of the peritoneum, and bathing in alcohol should be employed here. The author has developed this technique from experience with over 100 cases during the past six years. HORACE BINNEY.

Krotoszyner, M.: The Cystoscopic Diagnosis of Contracted Bladder. *J. Am. M. Ass.*, 1917, lxxviii, 687.

The following causes of contracted bladder are given by the author:

1. Congenital type — this is extremely rare.

2. Neurosis — neurasthenia and hysteria. Contraction results from continuous tonic spasm of the muscular coat. Classical descriptions have been recorded by Guyon, Guiard, and Janet.

3. Extravesical inflammatory processes resulting in peri- and para-cystitis and connective-tissue involvement, particularly in women.

4. Neoplasms: (a) Pressing on the bladder from the outside. (b) Intravesical growths and concretions, e.g., sarcoma and prostatic carcinoma. Contracted bladder due to stone is common in children.

5. Chronic cystitis, which in its final stage presents two main forms: (a) concentric hypertrophy of the muscular coat and (b) interstitial chronic cystitis. The first is comparatively rare while the second comprises the great majority of cases. This condition results from an extension of the inflammation of the mucosa to the muscular coat, replacing the latter with connective tissue. The intensity of symptoms depends upon the extent of the pathologic process. Constant dribbling occurs in all cases with a capacity below 50 ccm.

The clinical diagnosis of a contracted bladder is easily made. But the recognition of the underlying cause is essential to the application of a therapy leading to improvement or cure of the distressing condition. The differential diagnosis of inflammatory bladder contraction, *cystite douloureuse*, the abnormally small congenital bladder, and the classical tuberculous scar-tissue bladder is difficult.

The tuberculous type is by far the most common and in it the primary lesion is practically always in the upper urinary segment. Various authors are quoted in support of this view and references to the literature are given.

Cystoscopy in these contracted bladders is extremely difficult and in advanced cases gives barren results. As infection of one or both kidneys is practically always present, the only hope for the patient lies in the determination of the nature and extent of damage by such infection by means of the ureteral catheter. Ureteral catheterization, therefore, is the main object of cystoscopy in these patients. The author emphasizes the difficulties encountered and discusses the means by which they may be overcome. Painstaking work characterized by perseverance, gentleness, and infinite patience may, by repeated cystoscopic sittings, yield palpable diagnostic results. Overdistending the bladder must be avoided. By gradual distention of the bladder at successive visits the capacity may be increased. General narcosis finds no favor with the author. Air dilatation is also condemned. Brief sittings often repeated are preferable to any brusque attempt to force the diagnostic issue at one sitting.

Repeated cystoscopic examinations of short duration, rapid and skillful work coupled with gentleness and patience, may be expected to offer the greatest hope of success in these extremely difficult but important cases. H. A. FOWLER.

Randall, A.: The Gross Pathology of Median Bar Formation. *Ann. Surg.*, Phila., 1917, lxx, 471.

Although median bar formation, as a cause of vesical obstruction, was first described by G. J. Guthrie in 1830, the subject received scant attention for the next 60 years. For the past two decades this subject has been studied so thoroughly that today the only chapter of median bar formation left unexplored is the gross pathological picture of the condition. Little work has been done in a routine way at the postmortem table. Since it is impossible to trace clinical cases through their postmortem examination because of the rarity of such opportunities and the lack of appreciation of the clinical symptomatology, it seemed the wiser course to examine a long series of bladders, urethras, and prostates as they came to autopsy irrespective of age or clinical diagnosis. There have now been examined a total of 200 autopsy specimens in this series with ages varying from 19 to 79.

During postmortem examination of patients dying of various diseases, there can be frequently observed, in males over 40, indications of a mild degree of chronic prostatic disease associated with beginning trabeculation of the bladder; slight bas-fond indicative of retention and back pressure; ureters and renal pelves dilated slightly and a recent interstitial nephritis with indications of pressure atrophy in the parenchyma. Generally no complaint has been made by the patient which would lead to the suspicion of prostatic disease. These patients succumb to other affections, due to a resistance lowered by renal destruction and their clinical and anatomicopathological diagnoses rarely take into account the part played by the urinary obstruction. Clinically we know that frequently a patient bordering on uræmia is born anew to years of useful livelihood by the removal of a hypertrophied prostate and the time is now ripe that other forms of vesical obstruction of equal danger should be similarly studied and treated.

In this series of 200 cases, 46 have shown gross pathological changes in either bladder, prostate, posterior urethra, or seminal vesicles. Among 28 specimens of median bar formation found, 8 specimens are recorded as large, by which is meant that there is no doubt that the condition caused some urinary obstruction and retention. In the remaining 20 cases the bar is small. They are simply the early cases. The average age for the large bars is 57.7 and for the small bars 47.5.

It is possible to group these specimens into four types: 1. A type of abrupt bar or dam composed of fibrous tissue rising from, or better, stretched across, the posterior lip of the vesical orifice, formed of firm, dense, sclerotic tissue, whose edge is sharp and narrow and whose lateral terminations form an abrupt angle with the lateral walls of the vesical outlet. In these cases the trigone is usually shortened and in marked cases the verumontanum is drawn up directly under the abrupt rise which forms the median bar.

2. In the second type the bar is also fibrous on cross-section, has an upward tendency of growth, and seems to encroach upon the vesical trigone more than upon the urethral surface. There is an infolding or creasing of the trigone transversely and the ureteral orifices are close to the vesical outlet.

3. In the third type there is a bar due to glandular hypertrophy which has its origin in the true median lobe glands, under the sphincter muscle and within the prostatic capsule. Slight hypertrophy at this point will cause the formation of a thick, broad, round-edged bar and will cause an obstruction at the orifice long before a correlative amount of hypertrophy of the lateral lobes assumes any importance. This is the most frequent variety.

4. The fourth type of bar formation is due to a hypertrophy of the subcervical glands of Albarran alone. These hypertrophies are quite frequent and rarely develop as a definite bar, but rapidly assume the shape of a perfectly rounded lobe with deep lateral cleftings and though often causing marked evidences of urinary obstruction, even when quite small, are seldom in the class of true bar formation.

C. R. O'CROWLEY.

Bugbee, H. G.: Frequency of Urination in Women.
J. Am. M. Ass., 1917, lxvii, 693.

Frequency of urination in women as a symptom of some urologic lesion has been studied by Bugbee in a series of 1,000 cases taken from hospital and private practice. As to the frequency of this symptom, the author's experience is that a large proportion, perhaps a majority, of women who seek medical advice have some urinary disturbance. The factors concerned in the cause of the urologic lesion have both an anatomic and physiologic basis. These factors are: the situation of the female urinary organs; the physiologic exigencies of adolescence, of the childbearing period, and the menopause; lesions of the sexual organs; infection of the bladder from the rectum and appendix; infection and injury of the urethra during childbirth; and the elimination of bacteria by the healthy and diseased kidney.

Frequency of urination does not depend upon lesions of the bladder alone, and symptoms cannot be relied upon in determining the seat of the trouble. The key note in the study and management of these cases is a correct diagnosis. And this is made only after a complete history, a thorough physical examination and inspection of the bladder and urethra, and a study of the separate kidney urines.

The cases are divided according to decades into nine groups and the underlying cause sought in each case. A summary of the cases belonging to each decade is arranged in tabulated form and each is briefly commented on. The results of this study are indicated in the author's comprehensive summary:

1. The study of 1,000 cases confirms the hypothesis that frequency of urination in women is one of the most common symptoms of disturbance of the urinary system.

2. A closer association of the urologist with the pediatrician, the gynecologist, the neurologist, the internist, and perhaps the geriatrist, would doubtless lead to the discovery of many more cases of frequency of urination and accompanying lesions in women than at present find their way into the records either of the clinics or of the libraries.

3. Lesions of the urinary system in women are primarily a concomitant complication or sequel of the sexual and childbearing functions, secondarily of the sedentary life.

4. Urinary frequency during the earlier age periods is associated with acute infections much more frequently than in the later periods, which infections, in a large proportion of the cases, are localized in the urethra and trigone, and which if not properly treated go on to stricture formation. These are cases which, in the past, have been treated as cystitis.

5. Tuberculosis is not found in the first age period, nor is it found in the last four age periods.

6. Intermittent attacks of vesical irritability are of common occurrence, accompanying colon bacillus pyelonephritis.

7. The relatively common occurrence of frequency of urination following postoperative catheterization forces the conclusion that this procedure, as commonly practiced in hospitals and dispensaries, calls for radical improvement both as to technique and as to the instruments employed.

8. Calculi are comparatively common, in the ureter in young adults, in the kidney and bladder in those of advanced age. In the former, acute attacks of colic occur; in the latter, mild symptoms, or those of the accompanying infections are present. Fewer operations for acute appendicitis are being performed. More calculi are being assisted in their passage, or are being removed.

9. Prolapsed kidney with disturbed drainage and congestion must be acknowledged to be a predisposing factor in kidney lesions.

10. Urinary complications are common during the period of gestation.

11. It may be stated in a general way, that the findings in these cases with reference to the occurrence of cancer are not at variance with the commonly accepted views regarding the age incidence of malignant growths.

12. The frequent occurrence of cystocele in connection with the frequency of urination in women past the meridian of life suggests that this condition, in women, with the residual urine subject to infection, may be the analogue of the enlarged prostate, with its urinary disturbances, in the male.

H. A. FOWLER.

Caulk, J. R., and Greditzer, H. G.: Observations on the Bladder in Disease of the Central Nervous System. *Interst. M. J.*, 1916, xxiii, 36.

The internal vesical sphincter loses its tonicity early in some diseases of the spinal cord, as tabes dorsalis, and dementia paralytica, also in post-

apoplectic conditions, tumors of the spinal cord, exophthalmic goiter, paralysis agitans, lead poisoning, gumma of the spinal cord, continuous retention catheter.

On introducing the catheter, it generally meets an obstruction at the bulbomembranous junction, the spastic external sphincter. There exists a paralytic internal vesical sphincter and detrusor. Residual urine is always found, in some cases amounting to 1,000 ccm. Urine passes through the catheter until the same is withdrawn beyond the external sphincter.

Cystoscopic examination reveals a relaxed internal sphincter, which allows the cystoscope to be withdrawn into the posterior urethra and a view of the entire posterior urethra obtained. Ureteric peristalsis is slow and sluggish, five to six contractions to the minute.

In several cases the bladder was filled with a 10 per cent proteid silver solution and the patients allowed to walk up two flights of stairs to the X-ray department. The pictures of all show a well-defined boundary between the internal vesical sphincter and the urethra.

H. A. KRAUS.

Jacobs, L. C.: Two Cases of Poisoning from the Use of Alypin in the Urethra. *Calif. St. J. Med.*, 1917, xv, 268.

Although it has generally been the belief that alypin was without toxic effects, yet Jacobs reports two cases of poisoning from the use of this drug in the urethra, where the results gave undoubted evidence of the drug's deleterious action.

The cases were injected with two drams of a 2 per cent solution, after which instruments were introduced into the urethras. In one case the instrument had entered the deep urethra, in the other it had only passed the meatus. The first patient had clonic spasm, followed by tonic spasm, face cyanotic, dilated pupils, and the jaws were locked in spasm. The second patient's respiration had entirely ceased and he was apparently dead. Artificial respiration with traction on the tongue was followed, and the first patient took two hours, and the second five hours to recover from the poisonous effects of the anæsthesia.

From these cases the author draws the following conclusions:

That the toxic symptoms were the result of alypin absorption.

That the development of toxic symptoms is dependent upon the rate of absorption—a rapid absorption and hypersusceptibility of the patient to the drug.

That alypin is absorbed more readily from traumatized mucous membrane of the urethra.

That its toxic action is first upon the respiratory and then upon the circulatory system.

That when the mucous membrane is traumatized, it is not safe to instill a local anæsthetic as cocaine, alypin, and novocaine.

LOUIS GROSS.

Surraco, L. A.: Importance of Periurethral Adenoma in Urethral Strictures (Importance de l'adénome périurétral dans les rétrécissements de l'urètre). *J. d'uro.*, 1917, vi, 659.

The opinion formerly held that prostatic hypertrophy was never coincident with urethral strictures was to a great extent modified by the work of Guyon who showed that such coincidence though not common yet existed.

The author reports some cases to show that there is a certain amount of truth in the older conception. These cases, according to the author, show that where there is an advanced stricture, in which the ordinary symptoms are more accentuated at the age when prostatic troubles are probable, a cystoscopic and posterior urethroscopic examination is called for after the stricture is treated. This will show the state of the bladder neck, etc. If in some cases the lesions found to accompany stricture are characterized by an inflammatory condition of the prostate, in others (as in the author's case) adenomatous lesions are commonly found without leucocytic infiltration and without remarkable reaction of the connective tissue. From the results of cystoscopy and rectal palpation the older conception may be modified by saying that in patients with marked urethral stricture at the age of prostatism, prostatic hypertrophy of the rectal side is seldom found, but it is always or nearly always found on the urethral and vesical side. W. A. BRENNAN.

Stern, M.: Stricture of the Urethra. *N. Y. M. J.*, 1917, cv, 302.

The author describes an apparatus for irrigating the anterior or posterior urethra with a constant flow at a constant temperature devised mainly for the treatment of large strictures. He also describes an irrigating dilator with blades of very thin wire for treatment of subacute and chronic inflammations. This instrument is provided with both straight and curved tips for anterior and posterior application. The irrigations are given at a temperature between 120 and 130° F. To obtain beneficial results from hyperæmia, treatment must be given for twenty to thirty minutes.

A method for the localization and measurement of large strictures or infiltrations is described. It consists of an ordinary rubber dilator cover with a small olivary bougie inserted inside to give rigidity. This is passed into the urethra and injected with 20 per cent thorium solution and an X-ray taken.

FRANK HINMAN.

Reuben, M. S.: Tuberculosis Following Ritual Circumcision. *Arch. Pediat.*, 1917, xxxiv, 186.

The case is reported of a child which was brought to the Vanderbilt Clinic on November 11, 1916, at the age of nine weeks. On the eighth day he had been circumcised by a mohel, who aspirated the wound by means of a glass tube; within a week the entire wound of the circumcision had healed. Five weeks after the circumcision had been performed.

ed, a swelling in the right groin was noticed, and it was for treatment of this swelling that the infant was brought to the clinic. The same mohel who circumcised the patient had previously circumcised two other boys in the same family; the boys are respectively seven and five years of age and are both well.

Physical examination of the child was entirely negative. The inguinal glands in the right groin were enlarged, the whole mass being about the size of the little finger; there was also swelling of the left inguinal glands, but not to the same extent as on the right side; examination of the penis, on casual observation, presented nothing abnormal; the circumcision wound had completely healed; there was no ulceration; on closer scrutiny four small tubercular masses, each one separate and distinct, about one-eighth inch in diameter, were seen on the anterior surface of the circumcision scar; the frenum was entirely free of any infiltration; on palpation of these little masses, they felt not unlike shot under the skin; they felt hard and indurated. Under the microscope the tissue was infiltrated with numerous tubercles and diffuse tuberculous inflammatory tissue; the von Pirquet reaction of the infant was positive. Examination of the mohel showed that he was suffering from advanced tuberculosis and his sputum was loaded with tubercle bacilli. In the two weeks after the patient had been first seen, he gained about one pound and never had any fever. Excision of the tuberculous tissue of the penis and the inguinal glands of both sides was recommended. Tuberculides of the skin were not present.

A review of the literature shows that there are reported 42 cases, including this one, of tuberculous infection following ritual circumcision. In 37 cases the wound was sucked in the usual way; in 3 the wound was sprinkled with wine from the mouth of the operator; in one a dressing was applied to the wound on which wine from the mouth was poured on.

The first symptom is infiltration and ulceration of the wound area; in the majority of the cases the wound never healed completely; in 3 cases ulceration and infiltration had developed after the circumcision wound had completely healed. From two to eight weeks after operation enlargement of the inguinal lymph-glands takes place; the enlargement is usually greater on one side than on the other; gradually these glands enlarge and soften; suppuration due to mixed infection takes place, and in the majority of cases, within two or three months after infection, they break down. Systemic infection rarely occurs before the fourth month after the circumcision.

Of the 42 cases reported, 11 recovered, 16 died, and of 15 the final outcome is not known. Death usually takes place at about one year of age.

The prognosis is best in those cases in which early suppuration of the inguinal glands takes place and which are operated upon by curetting or excision.

The treatment of these cases is early excision of the tuberculous tissue of the penis and the inguinal glands on both sides.

EDWARD L. CORNELL.

GENITAL ORGANS

Milon: A New Method of Fixing the Testicle in Orchidopexy (Sur un nouveau procédé de fixation du testicule dans l'orchidopexie.) *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 134.

The first stage of the author's technique of fixation of the testicle in orchidopexy follows the customary procedure of opening the inguinal canal, incising the aponeurosis of the external oblique, and exposing the testicle. The cord and spermatic vessels are isolated from adhesions and freed along their length and the testicle placed in its proper location. The anterior wall of the inguinal canal is then closed by first suturing the upper half only of the sectioned aponeurosis. On each lip of the lower half of this section a strip, 4 to 5 mm. wide, is cut, free at the upper end and adherent at the lower end.

The two strips are reversed and drawn down by their upper free end toward the scrotal orifice. Suture of the edges of the aponeurosis is then completed and the anterior wall of the inguinal canal remade and closed to its lower orifice. The two strips are then intercrossed which brings the external toward the postero-internal side and the internal strip to the postero-external side. They are then sutured in this position, passing straddled over the cord, above which they form a bridge the arch of which is lax enough to allow free passage to the funiculus, but is sufficiently tight to prevent upward evasion of the testicle.

This procedure has given very excellent results without any ulterior disadvantage.

W. A. BRENNAN.

Kreissl, F.: Concerning Diagnosis and Operative Treatment of Vesical Diverticle. *Miss. Valley M. J.*, 1917, xxiv, 45.

The author emphasizes the importance of early diagnosis and treatment of vesical diverticula, before infection and its results, peridiverticulitis and extensive adhesions, compression of a ureter with consequent pyelonephritis or pyonephrosis may have occurred. In the majority of cases there is incomplete emptying of the sac with urination, and the increasing demand upon the muscle fibers of its wall produces first hypertrophy and later atony and dilatation. Previously symptomless, at this period increased frequency of urination and the voiding in two, three, or more phases appears. Later when peridiverticulitis has produced adhesions to surrounding structures (pelvic wall, sigmoid, seminal vesicles, etc.) pain is added to the symptoms, which may be identical with those of sphincter spasm, stone, prostatic hypertrophy, or obstruction due to bladder growths. The cystoscope will clear up the diagnosis; then radiography should be employed to determine the size, shape, and location of the sac

with reference to other structures. Usually a radiographic catheter should be placed in the opposite ureter to ascertain its relation to the sac.

The only satisfactory treatment is inversion of the sac or excision. The author prefers Pfannenstiel's transverse suprapubic incision as affording more complete exposure than the one usually used. He reports a case successfully operated on by this method. An important point in the procedure is the introduction of a catheter into the ureter before operation, if this is adherent to the sac, as a guide to prevent damage to the ureter. He emphasizes the fact that fractionary urination persists after operation, due to the perivesical adhesions and thickening.

HORACE BINNEY.

Sherwood-Dunn, B.: Prostatic Hypertrophy; Report of 400 Prostatectomies. *Am. Med.*, 1917, xii, 43.

The author describes the routine method of preparation of cases, the technique of operation, and the postoperative care followed by the French surgeon, Pauchet, in 400 suprapubic prostatectomies. To the character of the preliminary treatment is attributed the great reduction in the mortality. The first 100 cases showed a mortality of 10 per cent, the second, 8.1 per cent; the third, 6.5 per cent, and the fourth, 4 per cent.

The preparatory treatment is directed particularly toward avoiding such postoperative complications as uræmia, infection, pulmonary œdema, pelvic cellulitis, infection of the prostatic cavity, phlebitis, and embolism. Considerable significance is paid by Pauchet to his first impression of the clinical risk. If the patient is a thin, wiry subject with the appearance of good resistance he does not hesitate to operate at once. Of particular importance in the preparatory treatment are held forced ingestion of fluids, often with the addition of bicarbonate of soda, an exclusive fruit and green vegetable diet, the institution of a general routine massage treatment, and respiratory gymnastics. These respiratory exercises are regarded as of value for the prevention of subsequent pulmonary complications. For the estimation of renal function, Pauchet employs methylene blue and Ambard's constant.

Another factor which Pauchet regards as of value in lowering his mortality is the adoption of the so-called "two-time" technique in selected cases. The patient is submitted to the regulation of fruits, food, and exercise, as described, and in addition the bladder is opened and drained for from one to six months before prostatectomy is performed. This "two-time" procedure he applies to the following classes of cases:

1. Cases with incontinence and polyuria who have distended bladders.
2. Cases with infected urines.
3. Cases with marked renal insufficiency.
4. Cases in which catheterization has been difficult or painful.

5. Cases of marked clinical risk due to cardiac insufficiency, diabetes, obesity, etc.

Among the points in operative technique, the following details are emphasized:

1. Do not separate the bladder wall from the cavity of Retzius. Trauma to this region causes pelvic cellulitis.

2. A complete clean enucleation of the gland must be effected and the cavity left absolutely cleared of all débris. Pauchet considers that in an incomplete or poorly performed operation lies the greatest danger of infection.

3. The mucous membrane of the bladder and urethra should be severed as cleanly and neatly as possible in order to guard against subsequent stricture.

4. Pauchet considers that it is necessary to firmly pack the prostatic cavity with a special long single gauze in at least one-third of the cases. This packing is extremely painful and requires morphine.

5. In feeble subjects Pauchet considers it advisable to sever the vas deferens as a prophylaxis against the development of epididymitis, which in these feeble men often means a fatal termination.

For some time transsacral regional anæsthesia has been practiced by Pauchet to the exclusion of all general anæsthesia in thin subjects, a presacral in fat ones. Novocaine-adrenalin or novocaine-surrenine are used.

FRANK HINMAN.

Deaver, J. B.: Prostatectomy. *Tr. Am. Surg. Ass.*, Boston, 1917, June.

Results in prostatectomy are perhaps more dependent on careful selection of cases than for many other operations. Infection is often present together with kidney, myocardial, and vascular complications, and the general vitality of the patient is often at its ebb, so that all the usual functional tests, phenosulphonephthalein; phthalein; blood urea and indigo-carmin, should be made and treatment instituted to improve function and general conditions before attempting operation on the average prostatic. The cases fall into three general groups with gradations from one group into the other, each of which, however, should be considered a clinical entity and treated as such.

The first group comprises the early mild cases, in which symptoms are not exaggerated and the general condition is good. Operation in these cases need not be delayed beyond the necessary time for making the routine functional tests, and the effects, if any, of cystoscopic examination have worn off.

The second group represents a later stage of prostatism, with or without marked systemic changes, the most prominent symptoms of which are frequency of urination, dysuria, and hæmaturia. Although fair operative risks, these cases improve so much under pre-operative treatment as to materially improve operative prognosis. Keeping the bladder empty by intermittent catheterization usually suffices to relieve back pressure on the kidney in this type of case, and there is soon an in-

crease of phthalein output. Permanent catheterization has been abandoned in favor of suprapubic cystostomy, except for very severe cases in which this simple procedure is contra-indicated, or in certain instances in which it is desirable to obtain gradual reduction of back pressure on the kidneys, and improvement in coexisting cardiac conditions.

In the third group, fortunately comprising only a minority of cases, the spread of infection has produced most distressing symptoms involving the entire urinary tract. The obstruction at the bladder neck being due either to stricture, often inflammatory in origin, or to an adenomatous mass of the horse-collar or ball-valve type. There is little residual urine in the bladder, instrumentation is not well tolerated being often complicated by epididymitis, and the symptoms of hæmaturia, urinary distress, and toxæmia have reduced vitality to a very low ebb. These are not only poor operative risks, but prostatectomy often fails to relieve the symptoms. Prolonged pre-operative treatment is essential, although it sometimes becomes necessary to drain the bladder when under other circumstances prolonged treatment would be desirable. The mortality of this group is high. Differentiation from vesical tuberculosis and carcinoma is often difficult.

As to operation, the two-stage operation is used where catheterization fails promptly to relieve back pressure on the kidneys and wherever active urinary infection exists, also where there is a doubt as to the ability of the patient to withstand a suprapubic prostatectomy. For the preliminary cystostomy, as well as for the final enucleation, the author prefers ether or gas oxygen anaesthesia, preferably the former, or in cases with very high blood-pressure, chloroform. He regards spinal anaesthesia as dangerous. The technique of the operation is described in detail. Stress is laid on proper placing and testing of the drainage tube in order to secure perfect siphonage. This preliminary drainage of the bladder is continued usually for two weeks or until tests indicate a maximum physical efficiency. Enucleation is then proceeded with.

Where the most prominent nodules project into the urethra, the Squier method of dissection anteriorly through the roof of the prostatic urethra is the chosen one, as by this means there is little danger of injuring the sphincter muscle. The Freyer method of attack from the vesical aspect is the method of choice where the enlarged prostate projects into the bladder, and the sphincter having been pushed aside, there is little or no danger of injuring it. In many cases the author makes a circular incision through the mucous membrane and the overlying prostatic sheath around the vesical orifice of the urethra and carries the enucleation through this gutter, which, when completed, does not cause any irregularities of the mucous membrane such as have been known to cause subsequent obstruction and to require removal in order to restore function.

Profuse hæmorrhage is controlled by enlarging

the wound so as to give free access to the prostatic bed, placing a purse string or overrunning suture of plain catgut in the mucous membrane forming the margins of the cavity, and firmly packing the latter with a single strip of gauze, the free end of which projects through the parietal incision through the bladder wall alongside the drainage tube; after which the suture is drawn taut and tied.

Perineal prostatectomy is appropriate for cases in which obstruction is due to sclerotic conditions at the vesical neck; but the suprapubic approach is preferable where it is necessary to remove an obstructing bar, or where sclerosis of the bladder orifice indicates the excision of a wedge from one or more points in its circumference. In the hands of the expert, the one operation is as safe as the other, but to the less experienced the suprapubic route is the safer, since it is rarely attended with the complications, such as fistula, incontinence, and failure to relieve the obstruction at the vesical outlet, so frequently accompanying the perineal operation.

Gardner, J. A.: Technique of Prostatectomy—Considerations Based on a Series of 81 Cases Without a Death by the Two-Step Method. *Am. J. Surg.*, 1917, *xxxi*, 130.

It has been sufficiently demonstrated that the pre-operative care of these cases in old men is of the utmost importance. A suprapubic cystostomy under local anaesthesia with drainage by a Pezzer catheter is more satisfactory than other methods, such as frequent catheterization or the indwelling catheter with its often unavoidable trauma. After the function of the kidneys has improved, which is indicated by the patient's general well-being, although the phthalein test is relied on a good deal, the patients are ready for the second operation under a general anaesthetic, which needs only the stretching of the original cystostomy wound to permit the enucleation of the prostate. This takes but a few minutes.

In the two-step method it has been found that the congestion of the bladder and the prostate is very much reduced at the time of the second operation, therefore, there is less hæmorrhage. The first step of the two-step operation offers by its freedom from shock—half the operation over without general anaesthesia—a superior substitute for the indwelling catheter or frequent catheterization. When the patient has been put in the best physical condition, the second step consists simply in lifting up the adenomatous mass, which takes but four or five minutes. The average length of time the patient remains in the hospital compares favorably with those operated upon by the one-step operation.

Crenshaw, J. L.: Postoperative Complications Following Prostatectomy. *J. Am. M. Ass.*, 1917, *lxviii*, 611.

Crenshaw describes the technique adopted in the Mayo Clinic, after many changes, and found satis-

factory. It includes (1) a relatively large incision over a comparatively empty bladder, extraperitoneal if possible; (2) rupturing the prostatic capsule by inserting a finger into the urethra, controlling the hæmorrhage by sutures or rarely by packing; (3) closing the wound with catgut and silkworm with a No. 32 French, soft, pure rubber, double-eyed catheter in the upper angle and a small split or half rubber tube in the space of Retzius and out through the lower angle of the wound; (4) ether anæsthesia by the drop method.

Rectal saline is started as soon as the patient is back in his bed, surrounded by hot-water bottles. The bladder is irrigated only sufficiently to keep the tube draining, clots being washed out with a two-ounce syringe so assuredly to avoid overdilatation of the bladder. As far as possible opiates are withheld, though a single dose of morphine and atropine is usually given the first night. Water by mouth is encouraged as soon as the patient awakens from the anæsthetic, and light diet is started the morning after the operation. The patient is got out of bed on the third day, sometimes earlier, unless cardiac or other complications necessitate a longer stay in bed. One ounce of Epsom salts is given on the third morning. The tubes are left undisturbed until the fifth or sixth day, by which time there is a more or less permanent canal formed around the rubber drain, which somewhat prevents the spread of urine and infection to the rest of the wound. A continuation of bladder spasms after the urine is comparatively free from clots generally means that the bladder in contracting has caused the tube to prod into its base, and indicates withdrawal of the tube for an inch.

On the fifth day the tube in the space of Retzius is replaced by a narrow wick of gauze. The bladder tube is replaced on the sixth day by a smaller male catheter; the gauze in the space of Retzius is changed and shortened daily.

Most wounds in the bladder will close of their own accord if kept free from collections and reasonably clean. A previous suprapubic sinus in the midline should be excised at the second operation. The preparatory stab drain should be made an inch to one side of the midline. Every effort should be made to stop any urinary drainage from the lower angle of the wound, because this is the chief, and almost the only, cause of delay in the closure of the wound.

Postoperative complications are infectious or non-infectious, but many of the latter group may be due, at least indirectly, to infection.

Wound infection of a severe type is usually avoided if care is taken to have at the time of operation the bladder as clean and as nearly empty as possible; by using interrupted instead of continuous sutures; by leaving all drains undisturbed till the fifth day; and by applying a hot potassium permanganate dressing with the first evidence of redness, pain, or swelling in the wound.

Pyelonephritis, the most frequent complication,

often antedates the operation, and requires pre-operative treatment. Prophylactic treatment of postoperative pyelonephritis consists in avoiding septic collections in the wound and bladder, forcing fluids, and administering hexamethylenamine and acid sodium phosphate every four hours.

Epididymitis occurs relatively often, either primarily or secondarily to a previous infection. It is usually unilateral. It is often due to the use of a permanent urethral catheter. Keeping the testicles well supported is the best prophylaxis. During an attack, support with moderate pressure, and an ice-bag, if started early, will be all that is necessary. Heat causes more pain and increases suppuration. Although vasectomy may reduce the frequency of epididymitis, it does not preclude it.

Phlebitis is rather infrequent and calls for the usual treatment.

Immediate postoperative hæmorrhage can be reduced to a minimum by careful hæmostasis in the abdominal wound, by sewing the capsule, rubbing the inner surface until it contracts, packing a sponge wrung from boiling water for a minute, and, lastly, applying a gauze pack or the Hagner bag; finally, by reducing the irrigation to what is necessary to keep the tube free from clots.

Secondary hæmorrhage usually occurs from the fourth to the seventh day in patients who otherwise are feeling very well; it is due to the sloughing of prostatic tags. Morphine, an ice-bag, pressure on the perineum and removal of all tubes, and absolute rest, generally will be sufficient. In some cases transfusion may become urgent. Sudden, profuse and dangerous hæmorrhage might result from the sloughing through of a large vessel in the prostatic capsule. This would call for immediate reopening of the bladder and packing.

Renal insufficiency is of the acute congestive type with suppression of urine or of the chronic uræmic type. In order to have results the diagnosis should be made early.

Points to emphasize are the direct ratio between the local infection and the severity and number of complications; the necessity of early recognition and treatment of complications; the value of specially trained male nurses.

FAXTON E. GARDNER.

MISCELLANEOUS

Strachstein, A.: A Statistical and Clinical Survey of 591 Genito-urinary Cases. *N. Y. M. J.*, 1917, cv, 986.

Formerly the follow-up system was unheard of in any of our genito-urinary clinics, but during the past few years it has received rather careful consideration from several sources. As a result of this study it has been made clear that most genito-urinary dispensaries continue treating their patients until they are completely cured. The author's article is a further proof of this statement. The principal statistics of interest are the following:

out of a total of 377 gonorrhœics, 53 or 14 per cent were discharged cured, verified by all known tests; 129 or 34.2 per cent of the patients ceased treatment when the urine was clear, but were not yet well enough to be discharged as cured; 195 or 51.7 per cent of the patients ceased treatment while the urine was still cloudy. From these figures it will be noted that out of each 100 patients, only 14 took the trouble to keep up treatment until actually cured, and 34.2 per cent of the patients discharged themselves as cured as soon as the urine became clear, while 51.7 per cent discontinued treatment although visibly ill.

The author also quotes the survey published by Barringer and Platt in 1915, which is as follows:

	Clinic A Per Cent	Clinic B Per Cent
Discharged cured.....	9.7	9.4
Ceased treatment improved...	19.3	14.2
Ceased treatment unimproved..	71	76

M. M. Davis of the Boston dispensary, has reported 11.4 per cent of cures out of a total of 450 patients, while H. M. Sanford of the Lakeside Hospital Dispensary of Cleveland reported 12 per cent of cures.

The author's figures of 14 per cent are a little higher than the figures as previously published. The author has tried to answer the following questions?

What becomes of the patient who ceases treatment while still actively diseased, and why does he discontinue treatment? These are questions that are difficult to answer unless actively investigated. In a number of instances Strachstein has written to delinquent patients, telling them that his records show that they have ceased treatment although not as yet cured, and asking them to please inform him why treatment was discontinued. Some of these letters came back, indicating that the patient had either moved away or had given a fictitious name and address. The others were never heard from. It is safe to state that the patient who becomes indifferent about his infection, and in whom the inflammatory process lingers for months or even years not only spreads gonorrhœa, but ultimately acquires the worst type of urethral stricture. A number of patients attend the day clinics as long as they are out of work, but as soon as employment is secured they seek treatment at some night clinic or at a private office. Some object to being examined and treated by students.

From these few isolated reports, it would seem that our dispensaries are not as efficient as they might be in getting patients to come back for treatment. That the entire fault is not due to the dispensaries is evidenced from the author's statement in which he says that a large number of patients attend the day clinic as long as they are out of work, and as soon as employment is obtained they secure treatment either at some night clinic or with a private physician.

H. L. KRETSCHMER.

Walther, W. E.: Hæmaturia: Its Clinical Significance. *Med. Rec.*, 1917, 91, 854.

The author mentions his personal experience in a series of 78 cases of hæmaturia, and calls attention to the fact that hæmaturia is a symptom of grave severity, and that so many times physicians as well as patients have been prone to disregard the seriousness of this symptom. He condemns the custom so prevalent of administering drugs, either by mouth or locally, for a symptom-complex, the etiology of which is unknown. This practice cannot be too severely condemned.

The fact must ever be borne in mind that, in a high percentage of cases, hæmaturia is the first and only symptom of malignancy somewhere along the urogenital tract. Like many other truisms in medicine, this fact should be shouted from the housetops. The laity as well as the medical profession should be apprised of this fact. For years we have been taught that profuse and persistent hæmorrhage from the uterus is a dangerous symptom to ignore: that a tumor in the breast should always be promptly removed. Then why temporize with so serious a symptom of derangement in the genito-urinary tract when it, too, may mean malignancy?

The author believes that each of these cases of profuse hæmaturia should be subjected to careful examination including the use of the urethroscope, the cystoscope, the ureteral catheter, etc.

The following conclusions were reached:

1. A study of this series of 74 cases demonstrates the fact that hæmaturia was a symptom of new-growth somewhere in the genito-urinary tract in 51 per cent of cases. Furthermore, that 72 per cent of these tumors were malignant. Urinary calculi and renal tuberculosis were the next most frequent causes of blood in the urine.

2. The frequent occurrence of painless hæmaturia as a symptom of new-growth in the genito-urinary tract should impress upon us the importance of early subjecting all these cases to a thorough urological examination, including cystoscopy, so as to exclude this possibility.

3. The seriousness of hæmaturia as a symptom and the necessity of determining its cause should be impressed upon every patient troubled with bloody urine.

H. L. KRETSCHMER.

A. L. Wolbarst.: Surgical Aspects of Male Sterility. *N. Y. M. J.*, 1917, cv, 926, 976.

In considering the subject of sterility in the male, Wolbarst divides the subject into the following heads: Causes — azoospermia, oligospermia, oligonecrospermia, necrospermia, aspermia anatomical malformations, and the examination of the semen (coitus test). Azoospermia is divided into two classes: idiopathic and acquired. The acquired azoospermia is classified as obstructive and non-obstructive. The obstructive cases are due to lesions anywhere in the sexual tract caused by trauma or inflammatory diseases. The non-obstructive azoospermia cases are due to diseases

that destroy the spermatogenic tissues of the testicle, as syphilis, tuberculosis, and malignant diseases. It also occurs in general debility and different cases of serious acute illness, also in obesity and excessive use of tobacco.

Oligospermia the author thinks is due to chronic prostatitis, vesiculitis, and colliculitis, and is simply the forerunner of oligonecrospermia and necrospermia.

Aspermia is classified into two types, due to stricture and obstruction in the urethra.

These data may be amplified by a study of 87 cases of male sterility in which the wives were declared normal by the physician, who referred the husbands for examination and treatment. Duration of the married life ranged from 3 to 18 years. In every case an examination of the fresh seminal fluid was made, as described later. According to microscopical findings, the cases are classified as azoospermia, oligospermia, and oligonecrospermia. One case presented a typical aspermia. The following tables indicate the etiological factors in these respective conditions in the author's series of cases:

Azoospermia caused by	No. of cases
Bilateral epididymitis (gonorrhoeal).....	25
Bilateral epididymitis (tuberculosis).....	6
Cryptorchism.....	2
Small undeveloped testes.....	1
Atrophy of testes.....	2
Colliculitis with closure of spermatic ducts.....	2
Prostatitis and colliculitis (gonorrhoeal).....	1
Prostatitis and colliculitis (non-gonorrhoeal).....	2
Prostatitis with tight urethral stricture.....	1
Marked left varicoele (no other lesions).....	1
	43

Oligospermia caused by	No. of cases
Prostatitis and colliculitis (gonorrhoeal).....	5
Prostatitis and colliculitis (non-gonorrhoeal).....	2
Excessive coitus.....	3
Monorchism.....	2
	12

Oligonecrospermia caused by	No. of cases
Prostatitis and colliculitis (gonorrhoeal).....	16
Prostatitis and colliculitis (non-gonorrhoeal).....	8
Excessive coitus (no visible lesion).....	2
Undeveloped testes.....	2
Cryptorchism.....	1
Bilateral epididymitis (gonorrhoeal).....	1
Marked varicoele (no other lesion).....	1
	31

Aspermia caused by	No. of cases
Excessive coitus, colliculitis (non-gonorrhoeal).....	1

The author lays great stress upon the opening of the ejaculatory ducts and the cure of chronic vesiculitis and prostatitis by medication through the urethroscope. He also advocates more than the condom examination of semen and describes well the technique of the coitus test. In regard to the treatment

he mentions the use of the anterior lobe of the pituitary as employed by Lespinasse for the relief of non-obstructive azoospermia. For the obstructive types of azoospermia he advises the Martin operation of vasa-epididymostomy, the Lespinasse sac operation, and end-to-end anastomosis of the vas.

When the obstruction is due to lesions such as papillomata or cysts in the posterior urethra these should be destroyed by fulguration. If the ejaculatory ducts are closed by purulent material they should be opened by catheterization through the urethroscope. In the oligospermia and necrospermia cases the causative vesiculitis, prostatitis, and colliculitis should be treated by appropriate means. Artificial insemination is recommended in cases of oligospermia.

The author draws the following conclusions:

1. The treatment of sterility in marriage requires the most careful study of the generative organs in both parties, preferably simultaneously.
2. A woman should never be subjected to surgical measures for sterility unless her husband has been carefully examined and found capable of fertilization by the systematic efficiency test.
3. In the male spermatic efficiency, judged by the presence or absence of azoospermia, oligospermia, and necrospermia, must be determined.
4. To give trustworthy results, spermatozoa must be examined immediately after emission in contact with the natural female secretions.
5. In the study of 87 cases, 50 per cent were due to azoospermia, 35 per cent to oligonecrospermia, and 13.5 per cent to oligospermia.
6. Bilateral epididymitis caused azoospermia in 72 per cent of the author's cases; prostatitis, vesiculitis, and colliculitis caused oligospermia and necrospermia in 72 per cent of cases.
7. Sexual exhaustion (excessive coitus) is a frequent indirect cause of sterility.
8. Gonorrhoea was the underlying factor in 67 per cent of azoospermia; 42 per cent of oligospermia; 55 per cent of oligonecrospermia; 60 per cent of the total number were due to gonorrhoeal infection.
9. Syphilis appears to be a slight factor in male sterility.
10. Lesions responsible for the sterility were discovered through the posterior urethroscope in 47 per cent of the cases.
11. Treatment is surgical and must be applied either to removing the obstruction to the passage of the spermatozoa or to removing the pathological genital secretions which injure or destroy them.
12. Artificial impregnation is indicated in cases of subnormal spermatic efficiency and is often successful.
13. The probability of cure, excepting in azoospermia is about 33 per cent; in azoospermia much less.

V. D. LESPINASSE.

SURGERY OF THE EYE AND EAR

EYE

Hertel: War Wounds with Foreign Intra-ocular Bodies (Les blessures de guerre avec corps étrangers intra-oculaires). *Ann. d'ocul.*, 1917, cliv, 165.

Hertel reported that he had observed 242 foreign intra-ocular bodies, 60 per cent of which were steel, the rest being copper, stone, glass, etc. The force of the blow causes marked intra-ocular hæmorrhages. Small fragments penetrate as far as the posterior hemisphere; they penetrate the lid and may detach pieces of the orbital border. Double perforations are frequent. Metallic fragments less than 3 milligrams in size escape radiography, but Hertel's sideroscope detects pieces as small as two-tenths of a milligram.

In peace time the extraction is usually by electromagnet and is successful in all except about 8 per cent of cases. But in war the percentage of failures rises to about 30 per cent, owing to the later intervention, the force of penetration, and the fact that many of the substances are alloys containing phosphorus, etc., which are extracted by the magnet with more difficulty than in the case of steel fragments.

One-half of these extractions were followed by loss of the eye by infection or other complications. Glass almost always caused infection. The difficulty of treating such cases demands rapid evacuation of those wounded to a well-organized ocular service.

W. A. BRENNAN.

Adams, W. H.: Diagnosis and Treatment of Incipient Senile Cataract. *J. Fla. M. Ass.*, 1917, iii, 333.

The author emphasizes the importance of an early diagnosis of senile cataract, as in that stage only is it amenable to the form of treatment advocated; he cautions against diagnosing glaucoma as cataract from the color of the pupil, and also calls attention to the fact that patients with cataract occasionally see halos around lights, which symptom is generally regarded as pathognomonic glaucoma. The principal symptoms of beginning cataract, are: faulty vision, diplopia or polyopia, chronic conjunctivitis, etc., and attention is called to the two types — neuclear and peripheral — of cataract with their different objective and subjective symptoms.

As regards treatment, dionin drops are recommended for a more thorough trial, but the form of treatment strongly advocated is the subconjunctival injection of cyanide of mercury, with which is combined morphia, acoin or dionin to alleviate the pain, which at times may be rather severe for about an hour or two after the injection. The injection

is given in the lower half of the bulbar conjunctiva. The technique is very simple, the amount and composition of the formula varying with individual cases, about 30 minims of a 1:3000 cyanide of mercury solution being the average dose. No special after-treatment is required; reaction may be rather pronounced at times, but this is to be considered as an advantage. The result depends somewhat upon the amount of reaction obtained. The treatment is entirely harmless, and offers about the only well-grounded hope of any benefit from any form of treatment other than extraction later on. Attention is called to the prevalence of cataract in Florida, and the use of suitably tinted lenses and a correct refraction as prophylactic measures is advised. No claim is made for any originality in this treatment, but due credit is given to Colonel Smith of India, who is the greatest exponent of this form of treatment.

EAR

Mahu. G.: Application of the Carrel Method to the Treatment of Acute Mastoiditis (Application de la méthode de Carrel au traitement des mastoiditis aiguës). *Presse méd.*, 1917, p. 204.

In a number of cases of acute mastoiditis Mahu has used the following technique in three stages:

1. Mastoidectomy or very wide trepanation of the apophysis, curettage, and careful abrasion of all diseased parts. Immediate postoperative suture of the upper three-fourths of the wound.

2. Sterilization of this wound by irrigation with Dakin's fluid during a period as short as possible, but discontinued when the exudate shows no more than one microbe per microscopic field and when fever and other local or general contra-indications have disappeared.

3. Suture of the remainder of the wound.

Details of each stage are given. The number of cases treated or under treatment is insufficient to enable Mahu to present statistics. The cases treated include simple mastoiditis (some with denudation of the lateral sinus and of the dura mater), Bezold's mastoiditis with adenophlegmon of the neck. Suture of the wound has been made in periods varying from two to fifteen days.

The earlier the suture, the more rapid the recovery. The patients have recovered perfectly and in one-third of the time required with ordinary dressings. Cicatrization is quite regular but there may sometimes be some suppuration at a suture point. The Carrell method appears to be a valuable aid in the treatment of acute mastoiditis.

W. A. BRENNAN.

Dwyer, J. G.: Bacteriology and Cystology of Chronic Suppurative Otitis Media. *J. Ophth., Otol. & Laryngol.*, 1917, xxiii, 244.

In 53 cases the author found the following organisms: staphylococcus pyogenes aureus, 17 times; staphylococcus pyogenes albus and citreus, 6; streptococcus mucosus, 8; streptococcus hæmolyticus, 8; pseudodiphtheria (Hoffman's and Xerosis') 15; pyocyaneus, 16; proteus, 5; Klebs-Loeffler, 1; bacillus mucosus capsulatus, 3. As to the information to be obtained concerning the nature of the process by means of cytological examination of the discharge, the author states that evidence of granulation tissue is afforded by the presence of leucocytes of all kinds, large, small, mononuclear and polynuclear, normal and degenerated, but especially by lymphocytes which are very numerous, while epithelial cells are not uncommon. Bone disease may be marked by the presence of myelocytes or osteoblasts, or chemical analysis shows the presence of an increased amount of bone salts.

Cholesteatomata is indicated by the presence of closely packed squamæ with or without bacteria, a distinction that may at first glance appear unnecessary but is really of great importance, especially when the cells are of antlar origin, for a septic cholesteatoma in that situation affords stronger indication for radical measures than a non-septic one.

Among chronic discharges is one which is very profuse, foetid, opaque, and like cream. This is free from cells, either epithelial or septic leucocytic, but consists of throat organisms in an albuminous matrix, not true pus, therefore but a polymicrobial emulsion. This indicates no granulation, hence

measures to eliminate throat infection are indicated. The author concludes his paper with a glowing tribute to the efficacy of vaccine therapy properly controlled.

OTTO M. ROTT.

Hays, H.: Exploratory Tympanotomy. *N. Y. M. J.*, 1917, cv, 913.

The author's procedure is to make an incision between the auricle and the temporal bone in the natural fold present there. The incision extends from the upper pole of the auricle downward to the tip of the mastoid. This incision is deepened until the periosteum of the mastoid is reached when the dissection is continued downward along the posterior cartilaginous canal wall to the junction of this cartilaginous wall and the bony canal wall. An incision is made at this point of junction and the auditory canal is incised for about two-thirds of its circumference. The auricle and deeper tissues are thrown forward and held in position with a sharp retractor. With a sharp chisel the small ledge of bone overhanging the superior canal wall is chipped away, thus giving a full exposure of the drum which is only three-eighths of an inch away from the severance of the canal. To incise the drum, the incision is begun in the upper portion of Shrapnel's membrane posteriorly and continued along the circumference of the drum to the anterior quadrant, a flap of the drum thus made being thrown forward over the malleus, and through this opening the operative work is carried on.

The author has operated on two cases of catarrhal deafness and two cases of chronic suppuration with excellent results, but what the ultimate outcome will be remains to be seen.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Magruder, A. C.: The Faucial Tonsil in Its Relation to Systemic Conditions. *Colo. Med.*, 1917, xiv, 68.

The indiscriminate removal of tonsils is to be condemned, as it discredits the operator and operation in the eyes of the laity, but in cases of recurrent tonsillitis, or peritonsillar abscess; arthritis and muscular rheumatism associated with the attacks of tonsillitis; malnutrition in children where the tonsils are diseased; chorea and enlarged thyroid with hypersecretion, the tonsils should be enucleated.

The author hopes for a more accurate method of differentiating the diseased from the healthy tonsil and a closer co-operation of laryngologist, internist, and family physician in cases of obscure etiology before tonsillectomy is performed.

ELLEN J. PATTERSON.

Matthews, J.: Technique of Tonsillectomy. *J. Lancet*, 1917, xxxvii, 190.

After brushing the tonsils with a 10 per cent solution of cocaine, the operator injects 5 drams of a solution of cocaine, $\frac{1}{10}$ of 1 per cent, with 1 minim of adrenalin, 1:1000, making the first puncture about the edge of the capsule and two or more through the body and capsule of the tonsil into the fascia of the deeper parts of the tonsillar fossa.

Depressing the tongue until the palatoglossus muscle stands out, the operator places the end of the Robertson knife behind the point at which the palatoglossus joins the base of the tongue, curves it upward along the edge of the muscle over the upper pole of the tonsil and down along the posterior pillar with care not to split the muscle.

He then grasps the upper pole of the tonsil with the Richards forceps, separates the muscle and fascia with the flat surface of the knife and completes the enucleation with the snare.

The author uses no pre-operative preparatory treatment.

ELLEN J. PATTERSON.

Murphy, F. G.: Circumcision of the Tonsil. *N. Y. M. J.*, 1917, cv, 785.

The author maintains that quinsy and other infections that originate in the faucial region are invariably peritonsillar and not intratonsillar in origin. The lymphoid infiltration in and about the mucous glands and ducts in the peritonsillar region indicates that the pathogenic bacteria that pass to

the lymphatic and blood streams have their entrance through these channels. Attention is called to the fact that textbooks on histology incorrectly state that the mucous ducts of the peritonsillar glands open into the tonsil. Mucous ducts never open into the tonsil.

The author emphasizes the importance of establishing perfect drainage in the peritonsillar fossa, not only as a preventive of quinsy and systemic infections but to establish normal drainage in the tonsillar crypts. The unreduced plica-triangularis is claimed to be the causative factor in the buried tonsil. The plica has its analogy in the prepuce and should have sufficiently reduced before birth to cause no interference with the function of adjoining organs.

The plica between the tonsil and the anterior pillar is entirely removed, and, unless the tonsil is in an advanced state of atrophy, the plica below the tonsil is also removed. The operation, when properly performed, is efficient in more than 90 per cent of cases.

Patterson, N.: Excision of the Retropharyngeal Gland, with a Short Account of Two Cases in Which This Operation Was Carried Out. *Lancet*, Lond., 1917, cxcii, 487.

Nearly all cases of retropharyngeal abscess are due to suppuration of one or both of the two retropharyngeal lymphatic glands. Inflammation occurs first and in rare cases clinical symptoms will arise before suppuration. The abscess is at first confined to the gland, later it bursts through the gland capsule. Instead of opening such tubercular abscesses through the mouth they should be drained from the neck. When possible the diseased gland should also be removed.

The operative procedure begins with an incision from the tip of the mastoid along the posterior border of the sternomastoid about three inches. The deep dissection extends between the sternomastoid and the splenius capitis and levator angulæ scapulæ and separating the carotid sheath from its posterior attachments. The finger of an assistant in the pharynx pushes the gland toward the wound and helps to avoid perforation of the mucous membrane. In case of drainage for abscess it may be possible to remove the gland also. In very extensive abscess repeated aspiration from the outside with or without a modified dissection would probably be the best treatment.

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INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1917

COLLECTIVE REVIEW

WAR INJURIES OF THE SKULL

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ONLY one who has had occasion to review the publications on the various subjects of war surgery can form a conception of the voluminous literature which has appeared since the beginning of the present European war. On the subject of war injuries of the head, not including those of the face and jaws, the reviewer has been able to find references to 172 articles. The earlier publications are in reality the result of experience acquired in the Balkan war, those pertaining to the present conflict beginning to appear toward the end of 1914. The author has been able to critically review nearly one hundred of the contributions from English, French, and German surgeons and has selected only the more important of these for this article. Those especially interested in the various subdivisions of war surgery (head, thorax, abdomen, extremities) will find as a most valuable reference, the war surgical numbers of the *Beitraege zur klinischen Chirurgie*, Nos. 96 to 101. These include the contributions to the War Surgical Congresses held at Brussels in 1915 and at Berlin in 1916. The best articles on war surgery from the French standpoint will be found in the *Lyon Chirurgical* for 1915 and 1916. The contributions of the British surgeons are nearly all published in the *BRITISH JOURNAL OF SURGERY*.

VIEWS OF GERMAN SURGEONS

The papers read at both of the above mentioned War Surgical Congresses give the consensus of opinion from the German side. These are the articles of Erdelyi (155), Tilmann (48), Gebele

(62), Paul Mueller (154), Guleke (157), Marburg and Ranzi (66), Burckhardt (153), von Eiselsberg (152).

Every gunshot injury of the skull should be regarded as infected according to Erdelyi (155) and the wound fully exposed with removal of foreign bodies, bone splinters, and brain débris followed by provision for drainage.

Diffuse pressure from a hæmatoma is not so serious a complication as localized pressure due to bone fragments and foreign bodies driven into the brain. Even late cases should be operated upon immediately because the longer the pressure, the greater the number of tracts destroyed. Local anæsthesia and iodine disinfection of the scalp suffice in emergency cases. Hæmorrhage from sinuses can be controlled by packing and that from the dural vessels by transfixion. The wound in the skull should be enlarged with a rongeur and the brain explored for projectiles gently with the gloved finger. Prognosis depends on (1) the distance from which the projectile was fired and its velocity; (2) extent of destruction of brain tissue and location of such injury; (3) time of operation. Those operated upon in the first eight days give the best prognosis.

Even after the wound is healed, late complications such as abscess of the brain, epilepsy, paralyses, and psychical disturbances may make the prognosis unfavorable.

In Erdelyi's own experience operation proved best in three classes of late cases:

1. Where the injury of the skull appeared insignificant, but the wound was purulent.

2. Where there were still symptoms of brain injury, motor, sensory, or visual disturbances.

3. Where although there were no symptoms, there was reason to believe there was brain injury.

Penetrating wounds. In recent cases, expectant treatment should be instituted after cleansing of wounds of entrance and exit. In patients seen two to three weeks after injury conservatism is indicated unless (1) the wounds of entrance and exit suppurate, (2) if there is prolapse combined with pressure symptoms, (3) if motor or sensory centers are injured.

Tangential wounds. There is extensive involvement of the internal table, the splinters of which are driven at right angles into the brain. Operation is always indicated because it relieves the oedematous compressed brain. There may be permanent damage to the central convolutions as in 8 of 62 cases without naked eye changes.

Contact or punctured or depressed wounds. The inner table is extensively comminuted and the membranes show greater damage than the brain. The projectile may lie on or near the surface. It should be removed if possible after X-ray localization, because of the danger of late encephalitis, cyst formation, and paralyses due to the bullet wandering within the skull. Roentgenograms should be taken at frequent intervals if the bullet is not found.

COMPLICATIONS OF SKULL WOUNDS

Brain abscesses may exist for weeks without symptoms. The scalpel is the best instrument for locating an abscess but care must be taken not to penetrate the ventricle. Fortunately the majority of brain abscesses after gunshot injury are superficial. Rubber tube drainage is the most satisfactory method.

Encephalitis is a most dreaded complication and its presence is indicated by early stupor and pressure symptoms. It is progressive in the majority of cases.

Meningitis. In milder cases the exudate is serous but in all forms it is most marked at the base. As soon as the least suspicion exists of intracranial infection, lumbar puncture is resorted to. This is a great help, since the increased pressure when the spinal fluid escapes shows the incipient inflammatory changes in the injury of the skull, even though the spinal fluid be clear. If, however, the fluid be turbid, even without a bacteriologic examination, one should expose the injury widely because this may prevent a meningitis.

Prolapse of the brain. This is an expression of intracranial inflammation either reactive or in-

fective. If the former the wound is enlarged, if the latter it is treated expectantly.

Tilman (48) at the First German Surgical War Congress held at Brussels in 1915, stated that the inner table may be splintered and the brain contused with accompanying paralyses, even when the outer table is intact. The bone lesions in punctured, i. e., depressed injuries, are usually less than in the tangentials. The majority of penetrating injuries die at once, but they may survive, and then one finds extensive splintering at wounds of entrance and exit.

There is less danger from hæmorrhage than from infection and acute oedema (aseptic encephalitis). If one has aseptic surroundings it is best to remove all foreign particles. If the wounds of entrance and exit are small, in penetrating injuries, treat expectantly. Tilman advises against operation unless external conditions are favorable. Punctured wounds should be operated upon if the missile can be located with the X-ray. High fever may indicate absorption and not infection. Softening is the outcome of non-purulent encephalitis.

Gebele (62) says (1915) that the prognosis depends upon (1) the distance from which the shot was fired; (2) upon the projectile itself (the small caliber bullet has greater penetrating force but does less damage than the less penetrating shrapnel); and (3) upon the region of the brain involved. Tangentials do less damage than punctured or penetrating. The vertex may only be bent in with extra or subdural hæmatoma, or depression may be very extensive in tangentials. It should be corrected after removing fragments by enlarging both the scalp and skull wounds. If the brain is much contused, it is best to incise the dura, irrigate, and then close the dural wound again.

Penetrating wounds are treated expectantly unless symptoms of compression or encephalitis appear. Gebele removes the prolapse level with the dura.

Paul Mueller (154) emphasizes the value of the X-ray. If it is not available the wound should be thoroughly explored at once. The dura may be intact even when the brain is extensively injured. He leaves bone splinters and projectiles which are deeply imbedded but advises watching the latter with X-ray because they may wander and do damage later.

Guleke (157) believes that the division into penetrating, tangential, and punctured or depressed (*Steckschuesse*) gunshot wounds of the skull is the best one. The majority of cases of penetrating wounds die immediately, because

of the extensive destruction of the brain and skull. Small smooth bullets with slow velocity cause small wounds of entrance and exit with little destruction of the brain tissue, and consequently not much oedema unless infection supervenes. If the latter takes place only the middle third of the canal is involved.

Contact or depressed wounds produce relatively large fragments, owing to the minimal degree of force, which compress or penetrate the brain. The internal table is more extensively depressed than the external. Even when the latter appears normal, radiograms may show marked depression of the internal table. The projectile is found either in the bone itself or beneath it lying upon the intact dura or on the surface of the external table.

The brain injuries particularly of such contact or depressed wounds, in spite of the relatively large projectiles, are very slight in the absence of involvement of important centers and in the absence of infection. Traumatic cerebral oedema may remain within moderate bounds, the canal in the brain may close primarily, and the projectile be encapsulated. As a rule, however, the latter sinks on account of its weight and causes symptoms in that manner. In other cases a cyst or area of softening forms around the projectile in which the latter moves freely so that it can be removed at a later period. The most frequent complication of these cases where a projectile has remained is infection which leads to abscess of the brain, at times only in the immediate vicinity of the projectile, while the rest of the wound heals. This abscess may rupture into the ventricle or it may lead to progressive encephalitis and meningitis.

Tangential wounds cause the most extensive injuries of the skull and brain, the splinters being driven at right angles into the brain. In the more severe cases the external table is depressed as though it had been ripped open by a plowshare. The internal table is comminuted and scattered widely into the brain in the most severe form of segmental injury in which the wounds of entrance and exit are separated from each other by only a few centimeters, often covered by intact skin. The traumatic cerebral oedema which often follows involves the entire hemisphere and leads to a very marked prolapse of the brain, so that as a rule after such a variety of injuries, brain detritus in large quantity is discharged through the wound in the skull. So long as infection does not supervene such prolapses are of little significance. After sufficient drainage of the area of softening and retrogression of the cerebral oedema, the

superficial portions are desquamated and the entire process may undergo recovery. If infection supervenes, and this according to Guleke's experience is the rule, especially if the wound of entrance is large and there has been excessive tears of the dura, the inflammatory cerebral oedema assumes enormous proportions so that the prolapsed brain which appears very rapidly is strangulated at its base and ceases to pulsate. If one does not succeed in establishing drainage by preventing, or at least helping the strangulation, and by evacuating the foci situated in the depths of the brain, the patients die of progressive encephalitis or of diffuse meningitis.

That portion of the wound which is near the surface may heal and an abscess form beneath a perfectly healed external wound. Even in the most favorable cases extensive scars and adhesions of the brain to its coverings and to the wound in the skull occur, which are often followed by epilepsy, or a defect remains in the skull itself which must be closed later by bone-transplantations.

The question as to which form of gunshot injury of the skull should be operated upon and which should be treated expectantly has been discussed by every surgeon in the most active manner. When one considers how difficult it is to form any conclusion as to the gravity and variety of the injury from the clinical phenomena, viz., that the simplest soft-part injury can often not be distinguished clinically from the most serious destruction of the brain and that the external appearance of the wound does not allow one to draw any deduction in this direction, one must conclude that as a matter of principle every gunshot wound of the skull must be thoroughly examined whether the bone has been injured or not. Where there has been extensive comminution with prolapsing brain tissue just a glance will suffice to make the diagnosis. In contact (depressed) gunshot wounds and in the milder forms of tangential injury the wound in the soft parts must be retracted until the extent of injury to the bone has been determined. Since the main object is to prevent or limit infection more activity is necessary in cases where the brain has been extensively destroyed or exposed than in the smaller injuries where the wounds of entrance and of exit are simply puncture like.

Guleke advises non-interference in penetrating injuries after excision of the wound in the scalp and removal of splinters of bone and particles of brain tissue. If infection occurs, both the wounds of entrance and of exit should be enlarged.

In depressed or punctured wounds the condi-

tions are quite similar, but here one is concerned with the projectile which has remained behind. We know that aseptic projectiles can become encapsulated in the brain without causing any disturbances but it is rather a rarity, more so than has been generally assumed. After a period of latency, especially after considerable bodily exertion, disturbances arise. Since the majority of projectiles which have been driven into the brain should be considered as infected it seems desirable to remove all projectiles, in other words operate on all cases of depressed or punctured gunshot wounds of the skull. If this lies right near the surface upon the bone or in the bone itself, the removal is easily accomplished at the same time that one is relieving a concomitant depression of the bone. The conditions are different if through the opening of the skull one sees the traumatized dura or brain detritus. Guleke considers it wrong to operate upon cases and to look for the projectile until its location has been accurately determined by the X-ray, and he strongly advises the use of the X-ray for these cases before they are operated upon. If infection is present the conditions, of course, are different. These cases must be operated upon at once, the area of destruction in the brain opened broadly, all detritus of brain tissue and comminuted bone splinters removed. If one provides freely for drainage, the infection will not spread, and not infrequently the projectile will escape spontaneously, especially if the patient is placed in a position favorable to its escape for some time after the operation. He has seen two cases, however, where the outer end of the wound canal was closed and complications which ended fatally developed around the projectile.

In tangential injuries the destruction of the brain tissue and the comminution of the bone is so extensive that as a matter of principle one should operate upon them primarily.

Early decompression and drainage must be provided for (1) the traumatic cerebral oedema, (2) the constant outpouring of brain detritus upon the contused dirty wound edges and the regularly appearing infection of the entire area of destruction. The later one operates the greater is the immediate danger of infection and the orientation is made much more difficult by the subsequent oedema of the brain. Even though the external table be only contused and the internal table be fractured and depressed, the wound can be more readily taken care of and the depression relieved under aseptic precautions than at a later period. Even in patients who are moribund or apparently comatose one should not refrain

from operating as one is often surprised by their surviving or even improving after the operation. Local anæsthesia suffices in a majority of the cases where one can spare the time and the patient is not too restless. The main objects to be attained in the operation itself are to remove all material which is infectious or capable of producing infection and to provide for sufficient drainage. In order to do so, the wound edges in the scalp must be excised and the gap in the bone enlarged sufficiently to expose the wound in the brain and to drain it in a comfortable manner. Guleke warns against too extensive removal of bone. The cavity in the brain is examined with the finger, under continuous normal saline drainage. He strongly advises against primary suture of the wound as well as complicated plastics and the formation of flaps. No particular method of drainage is better than any other and one must profit by personal experience. He prefers a soft rubber drain. The most dreaded postoperative complication of gunshot wounds of the skull is prolapse of the brain, and he warns against making any firm compression bandages, because the prolapse is the direct result of a traumatic cerebral oedema and no ill-effects follow so long as it is within moderate bounds, because when the cerebral oedema begins to lessen, the prolapse disappears spontaneously. Even gangrenous portions do not need to be taken off, because they are cast off spontaneously. The prolapse increases greatly if infection is present and the pulsation of the prolapse ceases, and at the same time headache, stupor, restlessness, rise of temperature, and not infrequently slowing of the pulse appear, in other words the picture of brain abscess. The most positive sign of brain abscess is the cessation of the pulsation of the prolapse. In such cases one usually finds in the brain, pus foci or a progressive encephalitis without sufficient drainage. In such cases one must operate early by enlarging the opening in the skull considerably and draining the brain.

The next most dreaded complications after brain abscess are meningitis and progressive encephalitis. The latter often becomes quite extensive and spreads toward the ventricles, breaking into these and causing a fatal basilar meningitis. He is not in favor of lumbar puncture and has never seen any benefit from the use of urotropine.

In the discussion of this paper Steinthal called attention to three varieties of abscesses of the brain. First, the cortical abscesses which give the best prognosis and whose drainage is comparatively simple. Second, the subcortical ab-

scasses. Of these there are two forms — the subcortical concentric, and the subcortical excentric abscesses. The latter are much more difficult to find.

Buckhardt (153) says that ante-bellum views have been completely changed. Many patients who survive the immediate effects of the injury succumb from a suppurative meningitis after an interval of a few days to many weeks. He has confirmed the observations of Chiari that such sudden deaths are as a rule due to the extension of an area of suppurative encephalitis into the lateral ventricle. Autopsies show the dura adherent to the skull and very little if any evidences of meningitis in the vicinity of the original injury. The meningitis is most marked at the base, due to an extension from the ventricle, and in the latter one can see how the area of encephalitis has involved the wall of the ventricle. Direct penetration of the ventricle by a bullet is much less frequent than by splinters of bone, especially in tangential injuries.

The clinical pictures are familiar to all — rapid recovery at first, restoration of consciousness and improvement of the pulse. On the third or fourth day there is sudden or more gradual rise of temperature and death occurs in from one to three days. Or, on the other hand, everything seems to go well, fever if present decreases, focal symptoms recede, the patient has even left his bed, or a prolapse has formed which is being covered with granulations. Suddenly after weeks headache appears, the patient becomes depressed, symptoms of cerebral irritation appear, and he may even become maniacal. At the same time there is also rise of temperature and the classical symptoms of meningitis, such as rigidity of the neck, etc., appear, and death occurs.

Infection of the ventricle occurs more rapidly when its wall has been penetrated by splinters of bone than by extension of an abscess into it. In some cases a fistula from which cerebrospinal fluid is discharged may occur after penetration of the ventricle. If the infected secretion has sufficient drainage, the fatal infection of the ventricles may be absent for some time and a mild infection may even recede, but in the majority of cases in time the ventricle becomes infected, the above symptoms appear, and the fate of the patient is sealed. There is still another way by which an infection of the ventricles can occur late — a wound in the brain whether it stays flat or a prolapse occurs contains at its surface many necrotic masses of brain tissue. When these are desquamated, the ven-

tricle may finally be opened and a fistula discharging cerebrospinal fluid occur, through which the ventricle is infected.

The prognosis depends upon the relation of the injury to the ventricle. Meningitis due directly to the injury or to the operation was, in his experience, very rare. Burckhardt warns against careless puncture for abscess or too prolonged use of a drainage tube, as both of these may be followed by ventricular infection. Extensive involvement of the frontal lobes gives a better prognosis because of the fact that the ventricle does not extend far into it. A hæmatoma spread over the convexity of the brain may become infected and cause meningitis and the same is true of wounds passing through the accessory sinuses.

Prolapse of the brain is due to a lack of space within the skull and may be composed of either disintegrated or acutely oedematous brain tissue. A prolapse is always an evidence of an infective oedema of the brain in war injuries. If the inflammation is of a mild character, both it and the brain prolapse gradually subside. If an encephalitis exists, the ventricle is at last involved and death occurs. If a brain abscess is present recovery may occur if the pus is given an opportunity to escape externally.

The prolapsed oedematous brain becomes covered with granulation tissue which becomes firmer and is gradually covered by epithelium if the infection recedes. In a prolapse associated with a progressive disintegrating encephalitis, the surface is covered by necrotic masses which may be desquamated and thus lay open a diverticulum like projection of the lateral ventricle which often extends into the prolapse. Such a process is followed by an infection of the ventricle, meningitis, and death.

The prospects of success, after Burckhardt's experience of 306 cases, are greater in immediate operations. The only exceptions are smooth, penetrating wounds, but in all other cases an operation may prevent encephalitis and brain abscess or will permit of drainage for an infected ventricle. The dura must be exposed until it appears normal and then incised until the entire area of disintegrated brain is exposed. One must not explore too much in the brain tissue in order to remove splinters of bone. Punctured wounds should be operated on by all means, because in an unexpectedly large percentage of cases it has been found that the projectile remained outside of the skull and could be easily removed although it had depressed the bone itself. An abscess which can be prevented by an immediate operation is very liable to form

around the projectile and bone fragments. If the missile has penetrated the brain, suppuration is almost sure to occur if it is not removed, the exception being infantry bullets and bomb fragments less than the size of a pea. From Burckhardt's observations at autopsy and in the living he has found that as a rule a projectile does not stay in the midst of the brain tissue. Projectiles are often found either outside of the skull itself or in the opposite wall of the skull. Quite often the projectile was found lying free in the cranial cavity. It is much better to wait until an X-ray has been taken rather than to do unnecessary damage by exploring the brain in vain. In no portion of war surgery does one need an X-ray so much as in punctured fractures of the skull, and Burckhardt's later work confirms the fact that missiles are not so often found within the brain substance itself as external to it, often on the opposite side. Only small bomb particles remain in the brain itself. If a prolapse exists, one should operate. In acute prolapse as a result of sudden closure of a cerebrospinal fluid fistula, enlargement of the cranial defect is always indicated to allow escape of pus from the ventricle. One must not expect a brilliant result from an operation for prolapse because it is really only a decompression. Under no conditions should a prolapse be amputated. To puncture a firm prolapse is dangerous, because in both amputation or puncture of a prolapse one is apt to open a ventricle. Necrotic areas should be allowed to sequestrate spontaneously. Open wound treatment is especially indicated in an encephalitis which is breaking down and also in firm prolapses. Cerebrospinal fistulæ should be dressed daily. In regard to bony defects it is astonishing how much they will decrease in size. One should not do a plastic operation too early, because the infection may not have subsided and a diverticulum of the ventricle may lie directly beneath the scar. If there are neurological causes for a plastic operation, it is sufficient time to do such a plastic when the symptoms have appeared.

For a long time it was believed that the encephalitis which caused the prolapse was directly due to the projectile and the foreign body which was carried in with it. The conclusion has now been reached that germs which are carried in seldom lead to infection in cases of a minor degree of destruction of the brain. The infection is predominantly a secondary one in these minor injuries, i.e., it occurs after the operation. In large areas of brain destruction on the other hand, the germs which were brought in at the time of

the primary infection were the cause of the infection. Such cases cannot be saved and one should attempt in every way to prevent secondary infection.

Von Eiselsberg (152) made a report at the Second War Surgical Congress held in Brussels in April, 1916. He advises early operation especially in fresh tangential injuries if external conditions are favorable and the patient does not have to be transported. If these cannot be attained he advises that only the wound edges be freshened and the largest bone splinters removed. He is strongly opposed to complete suture without drainage as Barany advises.

Although the transition from a tangential to a segmental and from this to a penetrating injury is a slight one, it is advisable to divide them in this way.

Old tangential injuries. The patient should be X-rayed and studied for twenty-four hours. Absence of much suppuration as well as of general and local symptoms in conjunction with a negative X-ray contra-indicates interference. The patient, however, should be reoperated upon at a base hospital even though a primary operation has been done in a field hospital, if there is much wound secretion or marked mental disturbances, such as characteristic paralyses with retention of bone splinters in the wound as shown by the X-ray. In operating upon tangential injuries the bone should be removed until the periosteal elevator can be readily placed between the dura and the skull. The extent of brain injury is then determined by the use of the little finger and foreign bodies removed, and then several gauze strips, lightly packed, inserted for drainage. If the dura does not pulsate, this indicates an abscess, and a small sharp bistoury should be used to incise the dura and explore for pus. If an abscess is found a rubber tube should be inserted for only twenty-four to forty-eight hours on account of the danger of pressure necrosis into the ventricle. Death in these cases is due to a progressive encephalomalacia or to rupture into the ventricle. Perforation into the meninges is not nearly so fatal as into the ventricle. If meningitis exists, operation is of no avail. Lumbar puncture is of diagnostic and prognostic value but not of therapeutic. Of 65 tangential injuries 30 had abscesses. Of these 2 died. Of the 35 who had none, 11 died.

Penetrating cases. We are powerless against infection in the middle third; although the majority of these cases end fatally immediately or after a short time, it is surprising to see some of them run a course without symptoms or reac-

tion. Von Eiselsberg operates on such cases only when there are signs of progressive infection.

Depressed or punctured cases. These are best operated upon in base hospitals unless there are very severe intracranial pressure symptoms. Although experience with suicide cases in civil practice has taught that the projectile will remain without reaction in a large percentage of cases and as this view is still held by a number of surgeons, one must not forget that in these war wounds the projectile, especially if it is a large one, within the course of time causes abscess formation. Such an abscess may remain latent for a long period and then suddenly rupture into the ventricle. If the projectile does not lie superficially so that it can be easily removed, he advises leaving it, but following its migration with repeated radiograms, the advantages being better encapsulation and greater immunization. Abscess of the brain may arise through primary infection of the injured area or through secondary from some other foci in the body. The reason for so many failures in gunshot injuries of the skull is that we are powerless to deal with the encephalitis and the inflammatory softening of the brain as well as with the meningitis and prolapse. The latter may be due to a deep-lying abscess. When this is opened, recovery occurs, or a prolapse may develop on the basis of progressive suppurative changes of the brain accompanied by an intense surrounding oedema. The latter may recede, but the prolapse progresses and leads eventually to death.

From a prognostic standpoint prolapses can be divided into the unfavorable which resist all treatment, and the favorable which heal spontaneously. Every one tries to open an abscess back of the prolapse, but he advises leaving the prolapse alone. A fistula from which the cerebrospinal fluid discharges is a very disagreeable complication but often heals spontaneously. Von Eiselsberg advises covering the larger defects unless there is severe headache.

In 3 of 16 cases of late abscess there were no symptoms from seven to ten months. Of these, 15 died. Two were cases in which the abscesses developed after plastic operation. He prefers a free transplant from the tibia to cover skull defects and in 27 cases did this in 20. In 6 he used the Koenig method.

Epilepsy associated with defects of the skull should first be given medical treatment and if not benefited a plastic should be done, placing fat or using bone covered on both sides with periosteum.

Marburg and Ranzi (66) state that the symptoms of late abscess of the brain are quite char-

acteristic. The patient shows a rise of temperature for a while then suddenly the symptoms of a beginning meningitis, such as headache, vomiting, and rigidity of the neck appear. There is apt to be an increase in the already existing local symptoms, such as hemiplegia or aphasia. All cases of brain or skull wounds, in their opinion, should be observed for several months and if the slightest fever or signs of cerebral irritation appear the wound should be opened.

RÉSUMÉ OF GERMAN VIEWS

A study of all of the German contributions to war surgery of the skull show a general agreement upon the most important points. If one were to summarize these in the form of conclusions they would be as follows:

1. All gunshot wounds of the skull must be regarded as infectious and the injury should be as thoroughly cleansed as possible, foreign bodies removed, bone splinters and detritus treated in the same manner, and drainage provided for.

2. Intracranial hæmorrhage is less to be feared as a result of these injuries than a progressive encephalitis and other forms of infection.

3. Rubber tube drainage for abscesses of the brain seems to be the best for this purpose. There are great dangers in leaving rubber tubing for too long a period. Von Eiselsberg recommends not permitting them to remain more than twenty-four to forty-eight hours. The exploration of the brain with the gloved finger is regarded by all as the best method for locating foreign bodies.

4. The outer table may show scarcely any injury and yet there may be extensive splintering of the internal table and damage to the brain.

5. The best division of gunshot injuries of the brain in the opinion of all writers is: (1) penetrating, (2) tangential, and (3) depressed. Nearly all are agreed that the penetrating do not require any operation at an early stage unless there are symptoms of cerebral depression or of infection. At a late stage (two to three weeks) operation should only be done if there are evidences of suppuration, prolapse, or of focal lesion. In tangential lesion or injuries all are agreed that operation at the earliest possible moment should be performed in all cases because splinters are so frequently driven into the brain at right angles in this form of injury. Von Eiselsberg makes a distinction between recent cases of tangential injury, where he advises early operation and not to close them as Barany advises. In older tangential injuries he treats them expectantly if the X-ray is negative. Erdelyi also advises this,

and there is but little suppuration and no sign of brain injury. If, however, these are positive then operation should be done as soon as possible. The third form is the depressed fracture where the injury to the internal table is always greater than that to the external. The projectile often lies near the surface and there is relatively less injury to the brain than in the tangential variety of gunshot injury. He thinks the most frequent complications are brain abscess, progressive encephalitis, meningitis, and prolapse. The brain abscess, all agree, may be latent for weeks to months and then suddenly give rise to symptoms or death just as suddenly by rupture into the ventricle. The scalpel is the best method for exploring for such abscesses of the brain and Von Eiselsberg especially advises against careless puncture of the brain in the search for abscesses. A progressive encephalitis is one of the most serious infective complications and is a frequent cause of death. Meningitis may be due to infection from the immediate vicinity of the wound although this is quite rare, it being most frequently the result of a rupture of an area of progressive encephalitis or of an abscess into the ventricle. Lumbar puncture in these cases is of diagnostic and prognostic value, but of no therapeutic value.

6. That prolapse of the brain is invariably of an infective nature is the experience of almost every surgeon. And it is an indication for decompression supplemented by incision of the prolapse if there is no pulsation of the prolapse. Von Eiselsberg considers such an absence of pulsation in the prolapse as a valuable sign of abscess.

7. In cases of head injury seen at a late period at base hospitals one should operate only if there are evidences of suppuration in the wound and signs of brain injury.

8. The dura may be intact even when the brain is extensively injured. The absence of pulsation of the dura at a later stage is often a valuable sign of abscess formation.

Other valuable facts to be deduced from these articles are that projectiles are often retained in the brain and are the most frequent cause of brain abscess leading either to a perforation into the ventricle or a progressive encephalitis and meningitis. A prolapse of the brain may heal upon the surface and yet an abscess lie beneath. All depressed and tangential fractures should be operated upon at as early a period as possible. In the depressed fracture the projectile often lies surprisingly near the surface but seldom within the brain itself; hence X-ray localization should be employed before operation. No med-

dlesome interference should be encouraged in looking for foreign bodies, but if a projectile can be located with the X-ray and can not be removed the radiogram should be repeated at frequent intervals in order to follow the wandering of the projectile. Chiari has shown that such rupture of an abscess into the ventricle with resultant basilar meningitis is one of the most frequent causes of the late onset of symptoms after apparent recovery. The ventricle may also be infected by the perforation of a diverticulum of the ventricle which lies within a prolapse of the brain.

All authors are agreed that plastic operation for defects in the skull should not be performed for at least six months to a year after the injury. If a prolapse is present and the opening in the brain is large enough it should be left alone unless the signs of abscess appear. In the opinion of Guleke the most positive sign of abscess formation is the cessation of pulsation in the prolapse.

THE VIEWS OF FRENCH SURGEONS

Sencert (165) says that French surgeons in general, and especially those at the front, have become convinced of the necessity of early operation. Theoretically it is possible to distinguish wounds due to the different forms of projectile but such a division in practice is impossible to take as a basis for therapeutic indication. It is not always possible before operating to know whether a wounded man has been hurt by a ball of small caliber, a shrapnel bullet, or an explosive projectile. The information furnished by the wounded man is as a rule of little value and the external character of the wound does not always permit one to judge of the exact nature of the injurious projectile. Wounds of the skull which have passed through the base from the face itself are comparatively rare, the explosive force being expended chiefly on the face, and Sencert has never observed a penetration of the base of the skull which has traversed the mouth or the nasal cavities. Wounds of the orbit or of the ear with extensions into the brain are much more frequent. His experience is the same as that of the German surgeons, that there is a complete absence of any relation between the extent of the wound of the soft part and the extent of injury to the deeper structures, the external wound often being very minute yet the underlying destruction extensive. He considers it much better to explore the wound in vain than to have overlooked a serious lesion of the brain. Even a fissure in the external table, in the opinion of a majority of the French surgeons, demands

complete exposure because it may lead to the discovery of an extensive lesion of the internal table, and in addition such a fissure may be the source of a very extensive infection. The most frequent causes of death in the early stages is a meningo-encephalitis of a diffuse character, a slower death taking place later under the form of abscess of the brain. The entire wound in the scalp and skull and brain requires thorough disinfection and it is necessary to resect enough bone to give access to all portions of the wound permitting the removal of sequestra, resecting the edges of the cranial defect, disinfecting them and providing for drainage. The infection of the cerebral focus is favored by the pulsified condition of the brain mixed with blood-clots, a medium particularly favorable to the development of meningo-encephalitis. The only means of preventing infection of such a focus is to open the wound widely, remove the clot, the cerebral detritus, and the sequestra of bone and to provide for ample drainage.

The French surgeons all differ from the German in advocating more radical treatment for penetrating wounds on account of the fact that infection is so often carried in the track made by the projectile, by the latter itself, by sequestra, pieces of hair or of clothing. Twenty-five per cent of the cases operated upon in their ambulances and discharged as cured were dead at the end of twelve to eighteen months.

Latarjet (164) states that brain injury is always more severe than that of the skull. He, like Sencert, is a strong advocate of resection in penetrating injuries. One point referred to in this article is of great importance since it is the common experience of both German and English surgeons, viz., that an extensive area of cerebral destruction may exist beneath the intact dura mater and this should always be suspected when there is no pulsation of a bluish dura, and a more extensive trephining and opening of the dura is indicated. Every fissure should be followed for a short distance from the original seat of injury. The French writers make the same reference to intracranial hæmorrhage as do the German, viz., that extradural hæmorrhage is much less frequent than subdural, that is, one into the layers of the pia-arachnoid and that in general such hæmorrhages play much less of a rôle in gunshot war injuries than they do in those of civil life. When present, such subdural hæmorrhages cause the usual symptoms of compression of a more diffuse nature than is the case when the injury is due to rupture of the middle meningeal artery with resultant extradural hæmor-

rhage. In a hospital located 4 miles behind the trenches he adopted the following technique: first, to enlarge the wound in the skull freely until the entire area of cerebral destruction was exposed; second, to remove all of the bone splinters, to explore the area of cerebral contusion with the finger, and then to insert gauze impregnated with iodine into this area of cerebral destruction and also between the endocranium and the brain. He believes that the latter step acts as a cofferdam in protecting the area of injury by promoting the formation of adhesions around it. In this respect his experience is different from that of the majority of German surgeons who believe that there is less fear of a meningitis in the immediate vicinity of the injury than from one at the base which is the result of the rupture of an abscess or of an area of encephalitis into the ventricle.

Rendu (173) also believes that every wound of the scalp should be thoroughly explored and even if a fissure in the internal table alone exists one ought to explore in order to see the condition of the dura. All fragments of the internal table require removal and if the dura is torn the opening should always be enlarged in order to ascertain the extent of cerebral injury. Injuries of the venous sinuses are readily checked by packing. He also believes that the finger is best for purposes of exploring within the brain and that brain detritus should be drained carefully and for a long time.

Beriel (168) after a study of the healing of brain injuries concludes that extensive depression favors healing by permitting the edges of the wound in the meninges to become united with those of the brain area.

R. Leriche (169) believes that a prolapse is an expression of strangulation of the cerebral vessels by a bony ring which is too tight to permit of the necessary increase in the size of the brain as a result of the reactive oedema. Such a prolapse is the indication either of an insufficient decompression of a large area of contusion or of the presence of a foreign body, and even if the case is seen at a late period a secondary operation is the best means of treatment because he believes that early decompression would have prevented many prolapses. Death after injuries of the head is most frequently due to a progressive encephalitis in his experience.

Delore and Arnaud (166) also believe that the wound in the external table may be very slight and yet that of the internal table and underlying brain be very extensive. Like other French surgeons he thinks that a fissure should be thor-

oroughly explored and even advises going beyond the limits of the fissure. One should not go much further in exploring than the extent of the tear in the dura, foreign bodies and splinters being removed if possible at the first, and if not surely at a second sitting. With other French surgeons he is of the firm opinion that immediate operation before infection sets in is the best method of safeguarding the life of the patient. He counsels against the use of gauze drains and prefers a tube left in for a long time to permit the escape of cerebral detritus and inflammatory products. Such cases recover when the brain is extensively injured unless the ventricles are involved and the fissures in the bone do not extend too far. The surgeon ought always to do a lumbar puncture because it is of great service in recognizing a complication. The X-ray is invaluable. Trephining is indicated in penetrating injuries of wounds of entrance and of exit, and the same is true of tangential injuries. In the former method attention has already been called to the fact that the French surgeons are much more radical in penetrating injuries than those of the German school. Some of the French surgeons like Guibé (127), have great faith in lumbar puncture and believe that it prevents a prolapse.

Abadie (101) removes projectiles early under the fluoroscopic screen a day or so after the operation. Like practically every German surgeon the French surgeons disagree with Barany (30) who advises slow treatment, that is, suture after operation for an injury of the skull and brain unless evidences of infection are present. The only one who agrees with Barany is Jeger (31) who uses a transplant for covering the defects in the dura and then closes the wound primarily. Leriche believes that if the dura is found intact it should never be incised no matter how severe the underlying hæmatoma and contusion of the brain. This view, is quite different from that held by the majority of surgeons.

VIEWS OF ENGLISH SURGEONS

The article by Trotter (23) is a classical one in its descriptions of the underlying principles upon which the changes in conformation of the skull and of the cerebral circulation following gunshot injuries, depend. A careful study of his diagrams illustrating the changes which accompany a subdural change, of the effects of deformation of the skull by external violence, and finally of the action of bullets of different velocities and fired at varying distances, is warmly recommended by the reviewer.

The intracranial contents act as a homogenous medium toward a bullet and do not act as after hæmorrhage by the displacement of intra- and extravascular fluids in the order of their pressures.

The greater the velocity of the bullet and the closer it has been fired, the greater is the explosive effect against the inner surface of the skull. The bullet in all cases distributes its energy throughout the cranial cavity, the greater the velocity, the more energy is transmitted, hence the brain is more hyperacutely compressed. The results of the transit of a bullet may be thus summarized: (1) at maximal velocities — generalized explosive effects with extensive destruction of the brain; (2) at moderate velocities — explosive effect limited to exit wound, hyperacute compressing causing compression, and contusion — direct in track of bullet and indirect at cranial surface.

In depressed, i.e., punctured fractures there are either only slight or no compression or concussion symptoms and one is apt to underestimate the damage to the brain; hence they demand early radical treatment.

In contradistinction to nearly all German and the majority of French writers, Trotter believes that the most common cause of symptoms is hæmorrhage, especially subdural, which is often bilateral. Trotter agrees, however, with the surgeons of both countries in (1) advocating expectant treatment for deeply located projectiles, (2) in operation for cases seen at a later period if infective conditions are present, and (3) in thorough exploration of, even if there is only a small punctured wound of the scalp.

Sargent and Holmes (110) believe that penetrating wounds seldom require operation and are thus at variance with many German, but in agreement with most French surgeons. The immediate result of an injury is concussion followed by œdema which subsides spontaneously within a few days if there is no infection. Impairment of local function is often recovered from without operation, and as in civil practice the bony lesion is next in importance to that of the brain. There are two classes of cases: first, those in which the external wound including that of the skull and dura is relatively small, but there is extensive laceration of the brain by bone fragments, such a track requiring drainage by a tube; while in the second class belong the more superficial injuries in which after cleaning and removal of the bone fragments there is not a track sufficiently deep to put in a rubber tube. Neurological symptoms seldom if ever call for operation at an early stage and less so at a later

one. If the signs of compression are due to progressive hæmorrhages one should operate, but if they are only due to œdema they should be left alone or lumbar puncture done. Local damage can never be benefited by operation. There is more danger in early operation than after three to five days, because during that interval adhesions can form between the dura and the brain and there is less tendency to hernia on account of absence of œdema. The stereoscopic X-ray is indispensable. One should not search for foreign bodies unless they are near the surface.

All torn or bruised scalp and muscle should be excised and the dura exposed for a half inch beyond the wound in the skull. It is best to trephine alongside the bony defect and to work from this toward the center. The finger is the best instrument for removing bone and shell fragments under continuous irrigation. A perforated metal tube for drainage is preferred. A giant magnet may help in removing metallic particles. Lumbar puncture is one of the most valuable aids in relieving œdema and controlling the tendency to prolapse. Many of the early disturbances of function are due to concussion, œdema, and vascular disturbances rather than to local destruction of the brain. This is especially true in wounds of the longitudinal sinus, where the improvement is slow and continuous over long periods. Death occurred in nearly 25 per cent of the cases with prolapse which were sent to England.

Whitaker (134) says the time elapsed since injury is the most important factor which modifies results. In 106 cases he excised the injured or septic area of the scalp, exposed normal dura freely by wide removal of bone, removed foreign bodies and left the wound open. Both the wounds of entrance and of exit are thus treated in penetrating wounds especially if they are close together. Prolapse was less common if decompression was done and it subsided rapidly. Small bone splinters are usually taken care of and may be extruded later. Prolonged search for bullets must be avoided. An X-ray is desirable but not always to be had. He believes that a streptococcic shows less tendency to become walled off than a staphylococcic infection. The prolapse in the latter grows more rapidly; it and the adjacent brain becomes necrotic for a considerable distance and meningitis spreads directly from the injured area. Ventricular invasion is not so common in the streptococcic because the infection spreads in all directions, while in the staphylococcic it invades the ventricle through

a narrow tract where the wound in the brain is deepest and the ventricle nearest the surface. Bleeding from the vessels in the dura or brain or from the great sinuses is checked by muscle.

In depressed fractures, the skull wound is enlarged until a half inch of normal dura is exposed.

The first dressing should be applied in sixteen hours, then every twelve hours, using 5 per cent carbolic gauze. Even enormous herniæ subside spontaneously. One should operate upon all cases seen within three days. In those not seen for fourteen or more days it is best not to operate unless the X-ray shows splinters of bone driven into the brain.

In the intermediate period, with which this paper is concerned, that is, when the cases arrive seven to ten days after injury, Whitaker believes that operation is indicated when one or more of the following conditions are present:

1. Active septic processes in a badly drained wound.
2. Evidences of cerebral irritation, as fits, restlessness, or delirium.
3. Evidence of cerebral compression, notably severe headache.
4. Coma and slow pulse.

Cases in which operation is demanded by the conditions which should if possible be deferred. In this group are those with active and acute sepsis of the scalp, associated with evidences of cerebral compression or irritation. Before opening the skull, the scalp should be first thoroughly drained for twenty-four hours.

Cases requiring an operation which may be postponed according to convenience. These are clean cases with depressed fragments or foreign bodies of moderate size, which can be localized definitely and are in a position which can be reached without further injury to the brain.

Cases in which no operation is required. These are: (1) those with no evidence of sepsis, bone displacement, or a foreign body; (2) those with no evidence of sepsis, but with a foreign body not causing progressive symptoms; (3) cases already submitted to a primary operation in which both free drainage and sufficient decompression have been provided.

Cases about which there must always be some doubt about operating. Those whose general and local conditions are apparently hopeless. Active disinfection and stimulation and a skiagram are all that should be done in the first twenty-four hours. Cases already operated on, but patient dull and apathetic. These should be fed with a stomach-tube. The pulse and temperature are normal,

but the latter may suddenly rise and the patient die in a few hours, or he may slowly recover. In such cases he believes there has been a hæmorrhage into the ventricle without primary infection, but a staphylococcus albus secondary infection may occur with fatal outcome. In cases with healed wounds and no sepsis, but with a foreign body difficult to reach and symptoms of grave cerebral contusion but not of compression, operation will do no good.

Roberts (77) says that skiagrams should be taken at right angles to the wound. He excises the septic edges first, and if there is not bone injury sutures the wound without drainage. If there is a fracture the wound is enlarged, all fragments removed, and if the dura is uninjured the wound is closed without drainage.

Tabateau (79) studied 95 cases and believes small wounds of soft parts may have severe fractures and vice versa—large scalp wound and no fracture; may have no symptoms (definite) even if there is severe skull injury; hence all scalp wounds must be carefully examined for bone lesion. Their rule is to shave the entire scalp and examine the entire vertex. If the bone is bruised or the pericranium torn, the skull should be trephined, especially if temporary loss of function, persistent headache, vertigo, vomiting, and other signs of cerebral irritation are noted. If the dura is discolored, doughy, and non-pulsating it should be opened by a crucial incision, the brain being generally disintegrated, and causing abscess unless drained. Enough bone should be removed until an area of healthy dura one-half inch broad is exposed. Urotropine is advised.

CONCLUSIONS

The summary of the experience of surgeons in the European war is as follows:

1. Gunshot wounds of the skull are best divided into the penetrating (through-and-through), tangential (furrow-like), and punctured (depressed) varieties.

2. The penetrating variety does not require operation in war practice if the wounds of entrance and exit are small. If the latter are large and especially if they are close together it is best to operate. The middle third of the canal made by a penetrating missile is most liable to infection from retained foreign bodies.

3. All tangential wounds must be operated upon at as early a period as it is possible to secure the proper surroundings. Stereoscopic roentgenograms should be secured even if it is necessary to wait for twenty-four hours but such an examination is not indispensable. The appear-

ance of the external table is no criterion of the damage to the internal table in tangential cases. All larger bone splinters and foreign bodies should be removed, using the finger for purposes of palpation. One should not explore too much in the brain for deeply located bone fragments or foreign bodies.

4. All punctured (depressed) fractures require immediate operation, the same technique being employed as in the tangential variety. Wounds of meningeal vessels and of the sinuses are best controlled by the use of pieces of muscle or gauze packing.

5. The absence of symptoms of concussion and of compression in the majority of gunshot injuries should not lead to the belief that little damage has been done to the brain. The reactive cerebral oedema, non-infective in character in only a few cases, requires decompression, and the degree of brain prolapse is an index of the extent of the reactive, usually infective, cerebral oedema from the contused brain areas.

6. Prolapse of the brain due to infection requires immediate enlargement and drainage of the skull and dural wounds. If such drainage is not secured, abscess of the brain occurs very early with rupture into the ventricle and death from basilar meningitis. Such a complication may also follow days to weeks after the injury and be due to an infective encephalitis advancing to the wall of and then into the lateral ventricle.

7. A localized meningitis around the seat of injury is not so much to be feared as infection within the brain due to retained bone fragments and foreign bodies.

8. Pressure on the brain due to hæmorrhage, usually subdural, plays less of a rôle than pressure due to bone splinters or foreign bodies.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Chalier, A.: Complete Suppression of Dressings in Aseptic Operations (A propos de la suppression complète du pansement à la suite des opérations aseptiques). *Progrès méd.*, 1917, p. 116.

A short time ago Chalier published an article stating that it was possible to dispense with dressings in aseptic operations if three indispensable conditions were observed, viz., irreproachable asepsis, perfect hæmostasis, and hermetic suture of the teguments. The only after-treatment consists in painting the wound every day or two with tincture of iodine.

During the past four months Chalier has performed 34 such aseptic operations without dressings. They comprise: 1 laparotomy with gastro-enterostomy for pyloric cancer, 2 appendicectomies, 12 radical operations for inguinal hernia, 1 radical operation for crural hernia, 3 epididymectomies, 2 vaginal resections for varicocele, 1 extraction of deep shell fragment, and 2 removals of tumors.

In all these cases recovery was obtained per primam without the least hæmatoma and without a drop of pus. Only in 4 cases were some slight disturbances noted, and these yielded to treatment.

The results are unquestionably due to the minute care observed in asepsis and hæmostasis, supplemented by the systematic suturing of all the coats in stages, especially that of the subcutaneous cellular tissue, and by the hermetic closure of the skin. To effect this Chalier uses Michel needles (hooks).

The complete omission of dressings, according to the author, not only is advantageous as regards economy of time and material, but it especially saves the surgeon's time and facilitates the supervision in the after-treatment of the wound. Besides exposure to the air favors cicatrization.

The author acknowledges that Hingstong of Montreal used this method as far back as 1888 with excellent results.

W. A. BRENNAN.

Bonney, V.: The Sole Use of Reverdin's Needle. *Lancet*, Lond., 1917, cxcii, 994.

The saving of time in surgical operations is an important factor, and the following are methods of operative technique which turn upon the use of Reverdin's needle.

The needle has an eye which can be opened and closed by means of a slide and possesses the advan-

tage of rendering a second assistant unnecessary to thread the needles, they being threaded by the first assistant. Once the suture has been placed in the eye, the suture must go loose rather than under tension. After use the needles must be taken apart, cleaned, boiled, and stored in absolute alcohol, which keeps them from rusting. There should be two sizes of needles.

The author has devised a wrist ligature carrier which consists of a cylindrical metal box opening at either end, in which is contained a glass reel on which the ligature material is wound. The cylindrical box is attached to the wrist by a broad red rubber band. This carrier is useful in providing suture material for the Reverdin needles and for ligature of a large number of vessels. The author, when operating, wears a ligature carrier on each wrist and his assistant likewise, and the assistant threads the needle from one of the four carriers according to the kind of suture material desired.

To facilitate the work the author has devised scissors which can be held in the hand, leaving the index-finger and thumb free, the handles being gripped between the thenar and hyperthenar eminences and the shanks passing out between the index and second fingers.

To facilitate having instruments and swabs on hand in pelvic operations with the patient in the Trendelenburg position the author has devised a "knee-table" which consists of a plate of thin metal bent across its middle to nearly a right angle with a flange at one end. Toward the head of the patient is placed a screen which has a ledge projecting from it, forming a little table for instruments. The screen and the "knee-table" are covered with a sterilized body sheet.

The use of crystal violet as a means of providing a permanently sterile surface to the skin at the site of operation promises a solution of the problem of an absolutely sterile field.

V. C. HUNT.

McWhorter, G. L.: Gastric and Duodenal Infusion by Means of the Duodenal Tube; a New Procedure in Postoperative Treatment. *J. Am. M. Ass.*, 1917, lxxviii, 1395.

The author reviews the literature on the use of the biliary fistula as a means of giving infusion, etc., and the various uses of the duodenal tube.

The idea of using infusion through a duodenal

tube is new. The tube may be passed at the time of the operation or by putting the duodenal tube within a stomach tube, the stomach tube passed and then withdrawn, leaving the duodenal tube in the stomach. When the stomach is opened the end of the duodenal tube can be passed into the duodenum or even into the jejunum. The usual container and drip apparatus are connected and any desired solution used. The tube can be disconnected at any time for the purpose of lavage or of aspirating, to determine the absorption.

Two cases are reported in which this method was used with good results. CARL R. STEINKE.

ASEPTIC AND ANTISEPTIC SURGERY

Leriche, R.: The Sterilization of Infected Wounds by Sunlight (De la stérilisation par le soleil des plaies infectées). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1063.

The report submitted by Leriche is a confirmation on bacteriological grounds of the opinion expressed by him nearly two years ago that heliotherapy is the most powerful method at present of acting on an exposed wound for the purpose of biologically altering the state of it. All wounds can be readily sterilized by this means.

In the most favorable cases sterilization has been obtained in 48 hours after two exposures to the sun. The wounds have remained sterile during the following six days and secondary suture has then been made successfully. In the least favorable cases — irregular anfractuous wounds with fracture — sterilization has been obtained in from four to six days and has persisted as in the favorable cases. Leriche gives details of some typical cases; also curves to illustrate the progressive bacteriological examinations.

Regarding the technique when the sun's rays are not strong the wounds may be exposed for a long time; if the rays are strong short progressive exposures alone are necessary. These should not exceed a quarter of an hour the first few days, otherwise there may be erythema, or general reactions of temperature, headaches, etc.

Heliotherapy is not a panacea which obviates surgical intervention. Failure is certain in wounds not surgically treated and also in those insufficiently treated. In such cases even though the external appearance of the wound may be excellent, this will not be an indication of the real conditions at depth and the bacteriological examinations will not show improvement. Complete surgical intervention should be the first and most necessary act; and in places where exteriorization of the wounded area (superior part of thigh, pelvic lesions, etc.) it is best to recur to the marvelous drainage method originated by Carrel. QUÉNU confirmed Leriche in all points. He has used this method for more than a year past. The specific local action of solar rays in infected wounds is incontestable and there is besides its favorable effect on the general state.

DELBET, discussing the two actions by solar rays, the thermal and actinic, thought the actinic the most important. Solar rays do not act as a bactericide nor as an antiseptic in the ordinary sense. They act on the cells and on the organic fluids. It is very striking to compare what passes after an antiseptic bath with the action of air and light. If a wound be plunged into an antiseptic bath for two hours and the pus then examined it will be found that in the majority of cases there is an increase of microbes and that a pyoculture is more abundant. The inverse takes place after the action of light, which proves that the defenses of the organism have been increased. This appears to Delbet the most important fact. W. A. BRENNAN.

ANÆSTHETIC

Buchanan, T. D.: Unsatisfactory Anæsthesias and Their Causes. *J. Am. Inst. Homœop.*, 1917, ix, 1419.

The large thick-necked, robust athlete, who has not been run down by sickness, gives the anæsthetist the greatest trouble because of the period of excitement which is likely to occur.

A preliminary dosing with morphine or bromides is a great help in such cases.

For spasm of the glottis, the author advises the introduction of an artificial airway after the jaw has been pried open with a wooden wedge.

Rigidity of the abdominal muscles may be caused by the anatomical make-up of the person, or by the position on the table with extended legs, as well as by too light an anæsthetic.

Patients presenting a history of blood infection with extreme rapid pulse are bad risks.

In the author's opinion, the higher the red blood count, the higher the ether resistance of the patient.

In the discussion COSTAIN brought out the point that giving the patient more air will often reduce the abdominal rigidity, the patient being intoxicated rather than anæsthetized. R. B. BETTMAN.

Dagg, T. L.: Safety First in Anæsthesia. *Ill. M. J.*, 1917, xxxi, 407.

The author, addressing a group of railway surgeons, translates the general railway slogan of "safety first" into terms directly applicable to his own specialty of surgical anæsthesia. He classifies the preventable deaths from anæsthetics, the number of which he considers large, into those due (1) to the anæsthetic *per se*, (2) to its faulty administration, and (3) to pathologic, or physiologic causes in the patient. As corollaries, he illustrates the proper preparation of certain types of patients; he discusses and gives contra-indications for his general anæsthetic of choice, gas-oxygen, and in connection with the more toxic anæsthetics gives indications and, in detail, the technique for oil-ether anæsthesia *per rectum*.

As a dangerous anæsthetic, Dagg would discard chloroform entirely because of its general toxicity

and its especial effect of fatty necrosis of the liver. Ether, because of lowering resistance to infection, because of its slow elimination, its irritation of lungs and mucous membranes, and its prolonged depression, may, as chloroform, become a contributing cause to death in the presence of a nephritic kidney, a hæmolytic jaundice, or other similar complication.

Of deaths due to faulty administration of anæsthesia, the author condemns as the cause not the inexperienced interne or nurse, but rather in part the faulty hospital system which entrusts to such inexperience a responsibility second only to that of the surgeon, and in part the lack of training in administering anæsthesia in our medical schools.

Prostatectomies in very old men serve to illustrate the type of patient with inherent pathologic conditions which, without precautions, lead to an anæsthetic death. Added to a usually slow and faulty elimination there is often a coincident acidosis; thus the patient presents a dangerous anæsthetic risk and, surviving that, poor chances for operative recovery. Such an operative risk should have a few days' preparatory rest in bed. Elimination should be stimulated and the kidney function determined. Tests for acidosis should be performed and if they are positive, large quantities of water should be given, free catharsis instituted, and alkaline medication be given by mouth or by transfusion of Fischer's solution or be administered per rectum in solutions of glucose. With preliminary morphia medication usually gas and oxygen alone suffice for prostatectomy, in which, because these old men so easily become toxic, short operation time is important for recovery and safe convalescence.

Inherent physiological causes of preventable deaths are illustrated by severe shock, that is, the exhaustion of nerve or brain cells in the vital centers by overstimulus from pain, either traumatic or surgical in origin. Therefore, with a patient in shock and demanding anæsthesia, it is the anæsthetist's duty to abolish the pain by the least depressant means; morphia, the author suggests, and the anoci-association methods of Crile. To these, to prevent further depression, should be added quiet manipulation, warmth, salt, or blood-transfusion if there is much hæmorrhage, and anæsthesia by nitrous oxide gas and oxygen.

The foregoing types merely illustrate variations in preparation suitable for the patient in hand. Similarly the author seeks for the anæsthetic and technique particularly applicable to a given case, although preferring as a rule nitrous oxide gas and oxygen because of its harmlessness and quick elimination, the quick return to consciousness, and absence of after-effects, as nausea, vomit, etc. Ether, chloroform, and the drugs of spinal anæsthesia he considers toxic, with toxicity held long in contact with excretory organs through an elimination requiring days.

Head and face cases and some thyroid cases contra-indicate the use of gas. In operations about

the head and face the anæsthetist and gas mask are in the way, and in mouth operations oxygen cannot be excluded; hence Dagg prefers ether through a nasal tube or by endopharyngeal or endotracheal methods. In nervous thyroid cases oil-ether per rectum is chosen because by this technique anæsthesia may be induced without exciting the patient. In any operation about the head and neck, as in mastoid and brain surgery, rectal oil-ether anæsthesia gives a free field for the operators and great freedom of posture for the patient; and in lung complications it avoids, and therefore does not irritate, the respiratory tract. In fact, it may be used in any operation except upon the gastrointestinal tract though possessing, except in special indications, no particular advantage. It is contra-indicated of course in hæmorrhoids, colitis, and other similar involvements.

The author's technique for oil-ether anæsthesia per rectum is as follows: Following a cathartic on the preceding night, a plain enema is given four hours before operation. Two hours later a colonic flush is instituted and continued until the water returns clear, as a thoroughly clean mucous membrane in the lower bowel is necessary for proper absorption of the anæsthetic. One hour before operation $\frac{1}{8}$ to $\frac{1}{2}$ grain of morphia and $\frac{1}{150}$ grain of atropine is injected hypodermically. Scopolamine is used as an adjuvant to morphine at times but the profound sleep induced contra-indicates it as a routine. Forty-five minutes after the hypodermic injections the oil-ether for anæsthesia is introduced per rectum. The proportions used are two ounces of cottonseed or olive oil to six ounces of ether; the two are thoroughly mixed by shaking. With the patient in the Sims position, the mixture is introduced through a soft rubber catheter inserted five inches into the rectum, the rate of introduction being about an ounce per minute. Up to a maximum of eight ounces, one ounce of oil-ether is introduced for every twenty pounds of body weight.

A towel across the patient's face, retaining a part of the expired air, hastens the stage of anæsthesia and then serves to retain the anæsthesia at sufficient depth. In about half the cases a few whiffs of ether are needed to pass the stage of excitement. Should untoward symptoms develop, as too deep anæsthesia, depressed respiration, etc., the anæsthetist should cleanse the bowel completely by repeated washings of plain water and take the other usual precautions.

When the operation is completed, a colon tube is inserted four to ten inches into the bowel; the latter is massaged and the bowel content thus expressed into a basin; the amount not returned shows the amount of absorption. The bowel is washed repeatedly with cool plain water; then two to four ounces of olive or cottonseed oil is inserted and retained and the patient is put to bed. Post-operative nausea occurs but rarely, and the author has not encountered cramps, and rectal irritation or bleeding.

For the great volume of surgical work the author depends upon the gas-oxygen-ether combination administered by the closed method, and he omits ether where possible. With a preliminary hypodermic of $\frac{1}{16}$ to $\frac{1}{4}$ grain of morphia, he finds that in the ordinary case gas-oxygen alone suffices for 75 to 90 per cent of the operating time. During the balance of the time ether, vaporized and warmed to at least room temperature by a special apparatus, is added to the combination. By means of a special apparatus the patient partially re-breathes his exhalations.

The author summarizes his conclusions as follows:

1. Preparation of a case for anæsthesia is just as important as the proper selection and administration of the anæsthetic itself.

2. Such preparation consists in ascertaining the patient's true physical condition, both pathological and physiological, and so far as possible correcting these conditions before operation.

3. There should be no hard and fast routine procedure; the anæsthetic and method should be adapted to the patient.

4. Patients in traumatic shock should be protected from further shock while surgical repair is being carried out.

5. Patients in a state of autotoxæmia or acidosis should be prepared by rest and elimination for anæsthesia.

6. Efficient team-work by the assisting staff is a necessary adjuvant to surgical skill, and the most responsible member of the assisting staff should be the efficient anæsthetist.

JESSE D. COOK.

Milon: A Rapid, Practical, and Little Known Method of Anæsthesia for Minor Surgical Interventions (Sur un procédé d'anesthésie rapide, pratique et peu connu pour petites interventions chirurgicales). *Rev. gén. de clin. et de thérap.*, 1917, xxxi, 262.

Milon describes a method of anæsthesia which he terms the "Drain-Dumenil anesthesia," after its originators. The materials are two cotton tampons about 3 to 4 cm. long, each of which is impregnated with ethyl chloride for about 1 cm. and introduced into the nostrils. After about a minute and a half needles of crystallization will be observed at the cutaneous limit of the nasal orifice, and the patient's impressions become confused. A half minute later the patient's answers are monosyllabic and surgical intervention may be proceeded with. The physiologic effect is more analgesic than anæsthetic as the patient can see what is being done but does not suffer. There is no vasomotor disturbance, no congestion, no pallor. For the first two minutes the patient feels absolutely nothing, then there is a period varying from 30 to 60 seconds with about a 50 per cent painful perception. About 2.6 grams of chloride were used for each operation.

The author considers this method very suitable for short and rapid interventions, minor surgery, and painful dressings. The method is simple and inexpensive, is without danger, and an assistant is

not needed; neither is any mask nor apparatus necessary. The author mentions ten minor operations satisfactorily performed under this anæsthesia.

W. A. BRENNAN.

Marshall, G.: Anæsthetics at a Casualty Clearing Station. *Proc. Roy. Soc. Med.*, 1917, x, Sect. *Anæsth.*, 17.

Gas and oxygen anæsthesia meets the requirements best in slightly injured cases. Its only drawbacks are that the apparatus is somewhat cumbersome and the materials costly. Local anæsthesia can be employed only in a small number of cases on account of the multiplicity of wounds and their lacerated and soiled condition. Ether remains the most generally used anæsthetic. The great majority of slight cases are anæsthetized by Shipway's warm vapor method. For induction the mixed vapors of ether and chloroform are used; the patient is free from struggling so that it is seldom necessary for an assistant to stand by the patient. It is rapid; in a hundred cases which were timed, induction was invariably complete in five minutes. Anæsthesia is maintained with ether alone. There is an absence of secretion, and atropine is not given unless the patient has signs of bronchitis. Consciousness is regained quickly and vomiting has occurred in only 26 per cent of all cases, including abdominal cases. Since the warm vapor method was introduced, the drop-bottle has passed out of use. Compared with the open method there is a saving of at least 60 per cent of ether. There is much less diffusion of the anæsthetic into the atmosphere of the theater. This is important to those working in it at times of sustained pressure.

It has been urged that spinal anæsthesia would be of great value in military surgery. For men wounded in the lower extremities, it is a convenient and satisfactory method at a base hospital; cases of profound collapse do not occur. The same good results were obtained at a clearing station in all patients who had been wounded not less than forty hours before operation. It is to the man whose wounds are less than forty hours old and who has lost blood that spinal anæsthesia is dangerous. Of the recently wounded patients all do not collapse under spinal anæsthesia. It is important that one should be able to recognize beforehand which cases will tolerate this procedure. Is there any physical sign which will prove a reliable guide? The appearance of the patient is of little assistance, the pulse-rate and blood-pressure do not help at all. A valuable indication is obtained by determining the concentration of the blood. The method the author employs is to estimate the percentage of hæmoglobin in the patient's blood by means of a Galdane hæmoglobinometer. If a recently wounded man has a hæmoglobin percentage of over 100, it is safe to administer stavaine intrathecally. If the reading is below 100 per cent, he will almost certainly show a serious fall of blood-pressure and symptoms of collapse.

Subcutaneous injection of strychnine appears to be without value, both as a preliminary measure to prevent collapse and subsequently in its treatment. Intramuscular injection of pituitrin proved useless in combating the fall of blood-pressure. Intravenous saline caused temporary improvement in the one case in which it was tried, but the blood-pressure fell again after one and a half hours and the patient died. This last case was a man with a penetrating wound of the abdomen. The author's experience with spinal anæsthesia for these cases has been limited and unfortunate. Three men with penetrating wounds of the abdomen were each given 0.07 gm. of stovaine. In each case the injection was followed by a great fall of blood-pressure and death within a few hours.

Spinal anæsthesia is contra-indicated in shock. Incomparably good results are obtained with gas and oxygen and no other anæsthetic should be used for this type of case. The anæsthesia may be so light that the patient will move when nerves are resected.

The opinion is now general that chloroform is a bad anæsthetic for head cases. Operation may be performed under local anæsthesia; all tissues of the scalp are infiltrated in a circle widely surrounding the site of incision. A 0.2 per cent solution of novocaine with adrenalin is generally used. The forcible cutting of bone is disturbing to the patient, so that where mentality is unimpaired general anæsthesia is preferable. Warm ether vapor is exceedingly satisfactory.

It is in the group of cases with abdominal wounds that the warm vapor method has shown to the full its striking advantages. The quiet induction may save much loss of blood from wounded vessels in the peritoneal cavity. The easy breathing and diminished heat loss leave the patient in a remarkably good condition at the end of a long operation. With open ether 54 per cent of the abdominal cases had bronchitis after operation. With warm ether vapor the percentage has dropped to 14.7. Apart from copious hæmorrhage, there is one other procedure which causes a rapid fall of blood-pressure during abdominal operations. This is turning the patient on his side. The effect is produced only if the patient has been under the anæsthetic for a considerable time before being turned. For abdominal cases oxygen with the ether vapor is given. No atropine is administered

before operation as there is no advantage in giving it. Ether gives better results than chloroform in these cases. With chloroform the blood-pressure falls steadily and, if operation be prolonged, the patient may die before the abdomen is closed, or shortly after.

Hypertonic saline given intravenously raises the blood-pressure, slows the pulse-rate, and dilutes the blood for a longer period than does the normal solution.

EDWARD L. CORNELL.

Mendelson, J. A.: Spinal Anæsthesia. *Med. Rev. Res.*, 1917, xxiii, 421.

The author prefers the use of stovaine for intradural injections, furnished in ampoule form. The formula recommended is:

R—Stovaine, .08; lactic acid, .02; absolute alcohol, .2; distilled water, Q. S., 2 ccm. specific gravity lower than that of spinal fluid.

The dosage depends upon the age and condition of the patient. A graduated Luer syringe and a spinal needle are practically all the apparatus needed.

The patient is placed in a sitting position on the operating table; prior to being brought there, however, he is usually given by hypodermic, an injection of morphia and scopolamine. The field is made sterile over the seat of injection with a solution of iodine crystals in acetone. Immediately after the injection of stovaine, the patient is placed flat on the table, with head and shoulders a little lower than the rest of the body. Respiration is carefully watched; the pulse and blood-pressure observed as usual. Stimulation may be given if there is a marked fall in the blood-pressure, respiratory embarrassment, or if vomiting occurs. Such stimulation, if necessary, may be given by mouth or inhalation in the form of aromatic spirits of ammonia; by hypodermic, camphor in oil or caffeine and strychnine in full doses. Adrenalin in salt solution, given intravenously, he regards as being the most powerful and effective stimulant. Operation may be started five minutes after injection.

Before employing this form of anæsthesia, it is necessary that the operator should have a complete knowledge and understanding of what is to be done and what the effects may be. He should know the contra-indications, the emergencies that may arise and how to treat them. The danger of accident is small.

E. C. ROBITSHEK.

SURGERY OF THE HEAD AND NECK

HEAD

Sharpe, W.: Observations Regarding Head Injuries. *Internat. J. Surg.*, 1917, xxx, 135.

Sharpe reports a case of a child 9 years old, who after an apparently slight fall developed severe symptoms of fractured skull several hours later.

She was operated upon, making a perfect recovery. In the treatment of 239 adult patients with acute brain injuries he found only 79, 34 per cent, suffering from increased intracranial pressure, operating on them to relieve the pressure. The remaining 160 patients were treated by expectant palliative methods of absolute quiet, ice helmet, and cathar-

sis; shock was treated by routine. By carefully selecting the cases for operation and especially the ideal time for operating the mortality at the Polyclinic Hospital was lowered from the average 50 per cent to 37.7 per cent, excluding the moribund patients, dying within three hours after admission.

The most accurate means for determining increased intracranial pressure is the measurement of the cerebrospinal fluid at lumbar puncture by the spinal mercurial manometer. In mild cases lumbar puncture is of therapeutic value. Operation is contra-indicated in severe shock and in conditions of medullary collapse.

The use of the roentgen ray is of importance in doubtful depressed fractures of the vault, but no clear case of intracranial pressure should be allowed to "wait over night" in order to get a picture.

If the ophthalmoscope and the mercurial manometer show increased intracranial pressure operation for the relief of the pressure should be performed. The method of choice is subtemporal decompression and drainage. In the absence of definite localization of the cranial lesion the decompression should always be performed on the right side in right-handed patients, in order to lessen any possible damage to the adjacent motor speech area. The treatment should always be directed with the view of bringing the patient to as normal a state as possible in the future, not merely saving his life.

L. R. GOLDSMITH.

Barrow, J. V.: Bilateral Pneumococcal Parotitis; Report of a Case. *J. Am. M. Ass.* 1917, lxxviii, 1680.

Pneumococcal parotitis is very rare, only thirty cases appearing in the literature, eight of which were bilateral. It occurs mainly in the aged and debilitated. The earlier the complication arises in pneumonia the more serious the import, although the lung condition is not aggravated the symptoms of pneumococcaemia are greatly increased. As a rule as the process goes on to suppuration, drainage being accomplished naturally, through the ducts or by surgical incision, spontaneous resolution has occurred. The case reported by the author is unique in its termination by crisis.

R. B. BETTMAN.

Schreiber, F. C.: Salivary Fistula Following a Simple Mastoidectomy with Cervical Abscess. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 113.

The author supplements his case report with a reference to the anatomic position of the parotid gland and the structures which it harbors, the gland extending, as it does, in front of the ear from the zygoma above to the lower border of the body of the mandible below, covering the posterior one-third of the masseter muscle, and extending backward to the external auditory meatus, the mastoid process, sternomastoid muscle, and the posterior belly of the digastric, it forms a most formidable structure constantly to be remembered by the workers in

this special branch of medicine. Add to this, then, the structures which pass through its substance, namely: three nerves—facial, great auricular, and auriculotemporal; four veins—superficial, temporal, temporomaxillary with communicating branches to the internal jugular; internal maxillary, post-auricular, and one artery, external carotid, and its importance becomes even more manifest.

OTTO M. ROTT.

Rowlett, A. E.: Mandibular Anæsthesia. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Odont., 18.

The injection is carried out with 2 per cent novocaine in Ringer's solution, to which adrenalin, 1 to 20,000 is added. The addition of the adrenalin increases the toxicity of the solution. The point at which the needle should pierce the mucous membrane is on the internal oblique ridge of the lower jaw about 1 cm. above the occlusal surface of the last molar. The point of the needle should then strike the ridge. If it is desired to anæsthetize the lingual nerve, injection should be started at once. Advance the needle, being sure to keep in contact with the bone until the correct point has been reached, about 2 cm. from the internal oblique line, after which it will be found difficult to advance the needle further. The first symptom of a correct injection is the feeling of numbness of the tongue and lower lip on the same side. Anæsthesia is at its height about thirty minutes after injection and lasts for about three-quarters of an hour. With this method it is possible to cut simple cavities in lower jaw teeth without pain. Complete anæsthesia is not obtained where there is an inflamed periodontal membrane. For extraction, it is also necessary to inject the long buccal nerve. For injection of mental foramen, insert the needle in the sulcus of the mucous membrane between the two bicuspid, advance carefully until the foramen is reached, incline the needle downward, forward and inward, and advance into the foramen. This will anæsthetize the canine, incisors, first bicuspid, and sometimes the second bicuspid. The most important application of mandibular anæsthesia is its use in the preparation of the teeth for conservative work.

R. B. BETTMAN.

Hare, E. C., and Cole, S. J.: Double Dislocation of Jaw Simulating Fracture of the Skull. *Lancet*, Lond., 1917, cxcii, 880.

The case reported was that of a male, aged 23 years, an epileptic, who in an epileptic seizure March 15, 1917, fell forward striking the point of his chin on the pavement. Bleeding occurred from laceration of the chin and from both ears, the jaw being driven backward and fixed in the closed position. Crepitus could be elicited but no fracture of the jaw could be located. There was swelling and pain in each temporomaxillary joint. The jaw remained fixed and the patient was able to take liquids only. The discharge from the ears was bloody until the eighth day, then serous, and became purulent

after the seventeenth day. The temperature was 102.8° F. on the seventh day and irregular until the nineteenth day, when it became subnormal for several days until the onset of status epilepticus with ten to twenty-seven seizures each day. Death occurred April 12. Postmortem disclosed no fracture of the base of the skull. However, there was a fracture of the tympanic plate of each temporal bone and there was a septic arthritis of both temporomaxillary joints. There was no fracture of the jaw.

V. C. HUNT.

Villandre, C.: Repair of Cranial Defects (*Réparation des pertes de substance crânienne*). *Presse méd.*, 1917, p. 300.

During ten months Villandre has personally operated in 106 cases of loss of cranial substance. The procedures employed were; (1) cartilaginous cranioplasty; (2) osteoperiostic grafts taken from the tibia; (3) sterilized bone plaques; (4) paste composed of carbonate and phosphate of lime for small breaches. The author indicates the various types of lesions in which these methods were used.

The statistical results of the four procedures are as follows: osteoperiostic grafts, 32 successes in 32 cases, or 100 per cent; cartilaginous cranioplasty, 46 successes in 48 cases, or 96.8 per cent; sterilized bone plaques, 18 successes in 22 cases, or 81.8 per cent; lime paste, 2 successes in 4 cases, or 50 per cent.

A graft of living substance, bone or cartilage, removed from the patient himself and at a distance from the site of the loss of substance, is therefore the most practical and the surest method of repairing a loss of substance. Such reparations are without danger when they are made by a surgeon operating under rigid conditions of asepsis, and controlled by clinical and radiologic examination, to prevent any fragments being left in the cerebral substance. Of the 106 cases operated upon there was not a single death.

W. A. BRENNAN.

McCoy, J.: The Surgical Treatment of Suppuration in the Jugular Bulb. *Ann. Otol., Rhinol., & Laryngol.*, 1917, xxvi, 140.

The author describes the Voss, the Grunert, and the Tandler operations. In the case reported he employed the latter technique because in his opinion it gives the easiest, simplest, and safest method of reaching the jugular bulb and most skillfully avoids danger of wounding the surrounding vital structures. He condemns the methods of Alexander, Neumann and Piff.

The Tandler technique is as follows: (1) The mastoid incision and the incision for the jugular are converted into one. The sternomastoid muscle is separated for its entire length and pushed posteriorly. (2) One can then search for the spinal accessory nerve. When it is found, it is tied loosely with a suture so that it may be in good view during the operation. This may be dissected without danger and this nerve followed almost to its exit at the jugu-

lar foramen. (3) If the finger is then passed deeply into the wound, a space will be found between the styloid process and the mastoid process. Here the exit of the facial nerve through the stylomastoid foramen may be exposed. (4) The digastric muscle is separated from the digastric fossa and shoved forward and downward. If one works on a line below the stylomastoid foramen and this muscle, there will be no danger of injuring the facial nerve. (5) After pushing aside the digastric, the occipital artery may be ligated in two places and cut. (6) The jugular vein may then be separated with the margin of the jugular foramen, which can be felt with the finger. Then the uppermost portion of the vein is loosened after pushing aside the periosteum at the base of the skull, and the rectus capitis lateralis. (7) The bone is then removed from the sigmoid sinus to the bony margin of the jugular foramen, and the sinus bulb and vein are split wide open.

Several anatomic facts must be borne in mind in the performance of these operations. In the first place, it is found that the jugular bulb is very deficient on the left side of the skull in the majority of people—some say as high as 75 per cent. Inasmuch as three large and important nerves pass through the jugular foramen, namely, the glossopharyngeal, the pneumogastric, and the spinal accessory, in manipulations one must be careful not to disturb or injure these nerves, as the spinal accessory sometimes is situated ventrally and sometimes dorsally. This is the nerve which is most apt to be injured.

OTTO M. ROTT.

Rogers, E. B.: Three Cases of Brain Tumor. *Southwest. Med.*, 1917, i, 40.

Rogers gives case histories, including detailed symptomatology, of three brain tumors, namely, of the pons, left Rolandic area, and pituitary region. He correlates the symptoms to the necropsy findings in the first case, to the operative findings in the second case, and to the probable pathology in the third case. Characteristic brain tumor symptoms varied much in their presence and prominence.

Tumor of the pons. The patient, a 28-year-old man, had had, years before, multiple neurofibromata. Later symptoms were at first only muscular unbalance of the eyes, heterophoria. The disease, markedly progressive, developed in something over three months, insomnia, brief periods of unconsciousness, increased tendon reflexes, extreme restlessness and nervousness, with motor symptoms varying from choreiform twitchings and jerking of extremities to correlated movements as jumping up from a sound sleep and turning over. During nervous periods he was unable to concentrate, at other times he was mentally normal. There was a temporary beginning choked disk but no other localizing sign.

Wassermann was plus-minus; the spinal fluid was negative. He died after short coma. The postmortem showed that a single glioma of the pons

"largely obstructed the iter and produced an internal hydrocephalus."

This case was marked by the intensity and peculiarity of its symptoms and by an almost total lack of general symptoms and localizing signs; this is explained, with a relatively small tumor, by the predominance of local irritation over general pressure. The absence of headache, convulsions, nausea, and vomit indicate that though the growth partially closed the aqueduct of Sylvius, the internal hydrocephalus so caused was not extreme. The restlessness and heterophoria are explained by involvement of the anterior pons and of the cerebellar peduncles with irritation of the oculomotor nuclei. The absence of paralyses and anæsthesia indicates the non-involvement of the longitudinal nerve tracts. This might easily have been a dangerous case for spinal puncture as the spinal fluid was under no pressure and so was probably cut off from above. Such tumors are inaccessible for operation and unfavorable for decompression.

Tumor of the left Rolandic area. The case history, shorn of apparently unrelated gall-bladder and urinary symptoms, is as follows: The patient, aged 38 and a railway conductor, received a head injury seven years ago. For the past six years, at six-month intervals, he has had attacks with chill, fever, headache, nervousness, and sometimes nausea and vomit. Added to these symptoms and urinary complications, convulsive attacks began two years ago, occurring at rare intervals for seven months, when they became much more frequent. There was then no temperature, but a slow pulse, headache, vertigo, and vomit and, only in the severer convulsions, impaired memory and concentration; there was a beginning left choked disk, negative serum Wassermann, and the spinal fluid, appearing clear but under pressure, gave a negative Wassermann, plus globulin and a cell count of six. In a typical attack about this time a warning aura caused the patient to sit down, to hold his lower lip to prevent its being bitten, and to have someone hold his head to prevent soreness from extreme rotation of the neck muscles. There was first rotation of the head and eyes upward and toward the right; then, in turn, colonic convulsions of the right side of the face, the neck, the right shoulder and arm. There was no loss of consciousness but the patient could not speak. Following the convulsions there were anæsthesias in the involved areas with extensions to the right leg and foot.

Diagnoses of epilepsy and depressed fracture were made; operation confirmed the writer's diagnosis of tumor of the left Rolandic area. This, which microscopic examination confirmed as a glioma, involved the upper pre-Rolandic area and to a less extent the post-Rolandic area. The surface involved was the size of a half-dollar. There was no sharp line of demarcation from the surrounding tissue and compared with the latter the tumor was firmer, whiter, and strikingly lacking in vascularity. There was a definite thickening of the pia along the blood-vessels

and beneath them an accumulation of fluid, a condition often seen in epilepsy. The tumor could not be removed and a decompression was done.

Subsequent clinical history shows convulsions, many each day and increasingly severe, loss of consciousness at times for a day, eyes normal and disappearance of signs of increased pressure.

The irritative infiltration of a few glial cells into the motor area accounts for the main symptom, typical Jacksonian epilepsy; survival of the patient and more marked infiltration would lead to paralysis of the spasm area. The extent and location of the spasm defines the motor area invaded by the tumor. The anæsthesias might indicate post-Rolandic involvement; this, however, must have been slight as there were no signs of auditory involvement, aphasia, agraphia, etc. The attacks of severe convulsions, with headache, slow pulse, nausea, vomit, and vertigo, are explained by hæmorrhage into the glioma with its attendant increased irritation and heightened intracranial pressure.

Tumor of the pituitary region. The patient, a young married Mexican with a healthy family, had previously noticed dizziness and failing memory. Sixteen months ago there had begun attacks of headache, nausea, and vomit; four months later sight began to fail, first in the left field of the left eye and later to a lesser extent in the left field of the right eye. Four months later he lost consciousness in three or four of his attacks but had no convulsions; two months later exophthalmos was noticed. Examination shortly afterward showed persistence of the original nausea and vomit, loss of thirty pounds weight, extreme exophthalmos, blindness nearly complete, and almost complete optic atrophy with choked disk. The eyes reacted neither to light nor accommodation. General examination was negative except for exaggerated tendon reflexes. There was marked insomnia, dizziness, restlessness, and failing memory and concentration.

All laboratory tests were negative except a spinal fluid cell count of ten and globulin double plus, and an excavated sella turcica shown by the X-ray.

Following a right subtemporal decompression operation done three months ago the nausea and vomit ceased, the headache and insomnia lessened, the choked disk returned nearly to normal but there was no improvement in vision.

Present examination shows total blindness, increasing headaches, occasional nausea and vomit, exophthalmos and choked disk slightly more noticeable, and a tendency toward impotence throughout the last six months. The ingestion of large amounts of sugar has developed no glycosuria.

As to symptomatology, the general symptoms indicate tumor, and primary optic atrophy indicates its pressure on the optic nerve. The left homonymous hemianopsia localizes the pressure on the right optic tract and subsequent involvement of the right fields indicates extension to the left optic tract. Marked pressure on both tracts necessarily results in complete optic atrophy and following this the

development of choked disk is considered pathognomonic of tumor in the optic tract region. The choked disks are in part due to pressure on the cavernous sinuses and the exophthalmos is chiefly due to such pressure, though its relief following decompression indicates that increased intracranial pressure is partly the cause. Some nystagmus is the only indication of oculomotor involvement.

Cushing divides pituitary tumors into three classes: (1) those with hypopituitarism and cretinism, (2) those with hyperpituitarism and acromegaly, and (3) those with predominance of symptoms due to involvement of adjacent structures. The tumor in question doubtless belongs to the third class, the increased carbohydrate tolerance being the only marked evidence of interference with the physiology of the pituitary body. The disappearance of the choked disks and great improvement of symptoms following the decompression together with the later quick reassertion of symptoms indicate that the pressure is not due to the tumor alone but probably to closure of the foramina of Munro and a secondary internal hydrocephalus. Present indications are for further decompression either over the left temporal or sphenoidal area, the present mortality from the transphenoidal operation being reduced by recent developments to fifteen per cent.

JESSE D. COOK.

Tenani, O.: Traumatic Cerebral Hernia (*L'ernia cerebrale traumatica*). *Polidlin.*, Roma, 1917, xxiv, sez. *chir.*, 145.

Tenani has treated 16 cases of traumatic cerebral hernia. Cerebral traumatic hernia is a complication which may follow a craniectomy as well as an accidental trauma. The more important pathogenic factors are: interruption of the continuity of the cranial covering; that of the dura mater; a too narrow craniectomy. It may be manifested under the form of meningo- or encephalo-meningocele.

The symptomatology comprises phenomena inherent to the situation, to the extension, and to the anatomopathologic type of the cerebral hernia. Psychic disturbance may persist either due to the primary cerebral lesions or to the cerebral hernia; patients who are so affected are usually of a hyperesthetic and emotional type; idiopathic epilepsy may be present independently from lesion of the motor center.

There are different degrees of hernia: (1) transitory; (2) stationary; (3) progressive. The first type reduced spontaneously in a short time; the second is the most frequent and it always follows surgical intervention; in the third type septic and necrotic phenomena prevail.

An amplifying craniectomy always leads to reduction of the hernia by interrupting the circulatory disturbance of the herniated mass constricted by the narrow bony girdle, and frees the patient in a great degree from the sensory motor disturbances as well as from the danger of cerebral abscess or diffuse meningo-encephalitis.

Treatment of cerebral hernia may be by direct treatment; while in hernia of the first degree spontaneous reduction should be awaited, in that of the second degree the treatment of choice is wide trepanation to which in the case of meningocele, is added puncture of the herniated sac; in hernia of the third degree, according to the case, either trepanation or section of the necrotic cerebral parts with the thermocautery should be done.

Complementary treatment is represented by cranial prosthesis with plaques of celluloid, silver, caoutchouc, etc., which is best wedged in a groove excavated by the scalpel in the diploë above the margin of the osseous breach. The purpose of this prosthesis is to remove from the patient all preoccupation concerning the weak spot in his head, to protect against danger of trauma owing to the loss of substance; and for esthetic purposes. In the author's 16 cases there was no septic complication. Intervention is absolutely contra-indicated unless perfect asepsis of the operative region is guaranteed.

Preventive treatment of hernia consists in making a temporary prosthesis with a celluloid plate, and is indicated in those cases in which a very wide craniectomy must be done or when a wide incision of the dura is made which must be kept open for a certain time. A small opening is left for drainage.

W. A. BRENNAN.

NECK

Cahill, G. F., and Taylor, R. M.: Tumor of Carotid Body. *J. Am. M. Ass.*, 1917, lxxviii, 1898.

The patient was a stout, healthy-looking woman, with a firm, deep-seated mass on the right side of her neck, at about the level of the hyoid bone and presenting just anterior to the border of the sternomastoid muscle. It felt lobulated and was not movable to any extent. There were no signs of any involvement of the adjacent nerves. She stated that the mass had been present for at least eight years.

On exposing the tumor it was found to be very vascular, reddish like thyroid, and quite firmly attached to the deeper structures. An attempt was made to deliver the tumor, but this was found impossible. On careful dissection, it was found that the internal jugular vein ran into the mass and seemed to be incorporated with it. The jugular vein was ligated above and below the tumor. It was then possible to dissect the tumor free from the common carotid. It was located between the external and internal carotids, extending down into the bifurcation crotch, where it received a large arterial branch. After the ligation of this branch, the tumor was removed. Just below the tumor was a small round mass resembling a lymph-node, which was also removed. On account of the close relation of the tumor to the hypoglossal nerve, the nerve was considerably stretched in the removal. The oozing of blood, until the tumor was removed, was very free. The wound was closed with a small tissue drain.

Microscopically the growth was surrounded by a thin, but complete fibroid capsule, from which delicate interlacing trabeculae extended inward. These fibroid trabeculae served the double purpose of carrying the blood-vessels and acting as a support to the tumor-cells. The primary blood-vessels were quite large and the walls well formed by both connective and smooth muscle tissue. The large vessels soon branched and finally broke up into a fine capillary network. The principal cell of the growth was a rather large cuboidal or polyhedral cell with a relatively small and deeply staining, centrally located nucleus, in which a nucleolus could usually be recognized. The cytoplasm was relatively abundant, stained rather indifferently with eosin, and had a homogeneous or finely granular structure, but frequently contained small vacuoles. In some instances one cytoplasmic mass seemed to contain several nuclei. The cells were regularly disposed on a fine interlacing honeycomb-like stroma, which also contained the capillaries.

EDWARD L. CORNELL.

King, B. T.: Some Points on the Etiology and Treatment of Goiter. *Northwest. Med.*, 1917, xvi, 168.

Being convinced that the exciting organism of goiter has as its chief habitat the intestinal canal, the author hoped to be able to segregate an organism that might produce goiter in animals.

Cultures were made from the faeces of twelve or fifteen goiter patients. The only noteworthy finding was the almost uniform absence of the true

colon bacillus. Many types of colon bacilli were found, some conforming to the characteristics of the paracolon group, while others did not conform to any classification. A large number were similar in the different individuals and their chief characteristics were: (1) almost none mobile, (2) slow in forming gas, (3) acid in reaction, (4) dulcitate and mannit-negative, (5) indican negative. They grew about as well in room as incubator temperature. Cultures taken from the gills of an infected fish showed many similar characteristics, though differing in others.

If the colon is the habitat of the organism, it will be found only in certain selected early or acute cases, or found not to predominate in cases of longer standing goiter. This opinion is borne out, first, by the fact that many cases after a time get well of their own accord, especially if the patient be removed from a community in which goiter is endemic, or if put on boiled water for considerable periods; second, because patients occasionally recover by the use of daily doses of sodium phosphate.

These conditions can be explained by assuming that the organism is of low vitality and, if not replenished from time to time, the more active intestinal flora overcome them. Also, periods of quiescence in the development of goiter may be explained by the temporary subsidence of the infection with new growth of thyroid following a new infection. This is mere speculation, but it offers a very complete explanation for the clinical course of goiter.

EDWARD L. CORNELL.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Simmons, R. R.: Adenocarcinoma of the Breast Occurring in a Boy of Thirteen. *J. Am. M. Ass.*, 1917, lxxviii, 1899.

The patient, aged 13; American, height 5 feet 5 inches, weight 127 pounds, well built, healthy and strong, had never had any serious illness, and was considered very hearty. About one year previous he had been struck in the right breast with a baseball bat. The blow was light and caused no immediate soreness. Soon after this violence the patient noticed, after exertion, a burning and stinging sensation in that breast. Five months before the patient was seen by the surgeon, swelling became noticeable and there was some tenderness. A radical operation was performed.

Microscopically there was a marked proliferation of the gland elements throughout the sections. The newly formed glands were very irregular in shape and the epithelium was arranged in many layers. Some showed definite lumina, while in others the proliferation was so great that the lumen was entirely filled up with cancer-cells.

EDWARD L. CORNELL.

Elliott, T. R., and Henry, H.: Infection of Hæmothorax by Anaerobic Gas-producing Bacilli. *Brit. M. J.*, 1917, i, 413, 448.

One-fourth of all cases of hæmothorax from gunshot wounds of the chest are infected, and because of this frequency early exploration for bacteriological infection is adopted in all military hospitals.

This paper deals with the growth in a hæmothorax of certain anaerobic bacilli producing gas. In a series of 195 cases of septic hæmothorax, 87 or 44.6 per cent were infected with such bacilli.

After a latent period of varying duration, the gas and poisons produced by the bacilli may develop in many instances with fulminating rapidity amid the hæmothorax, so that a case which on the second or third day following the wound was regarded only with suspicion of sepsis has often been seen to pass in the next forty-eight hours into a state of the gravest danger. However, under the present methods of early diagnosis and proper treatment, the mortality has been reduced to 10 or 15 per cent. There is a greater liability for anaerobic bacilli to be carried in by shell fragments than by rifle bullets.

The infection may be a generalized form being

disseminated throughout the fluid hæmothorax, or it may be localized in a mass of blood-clot lying at the bottom of the pleural cavity to begin with and later disseminated by the organisms escaping through the blood-clot to the entire fluid hæmothorax.

The exploring needle is the most valuable means of arriving at an early accurate diagnosis and should be used daily whenever doubt arises. An offensive odor of the sample withdrawn justifies surgical treatment at once. Several varieties of fluid may be obtained:

a. Blood with an offensive odor, purple color which is darker and more transparent than venous blood. The purple color is characteristic of an infection by anaerobic bacilli, but the foul smell is the chief criterion.

b. A fluid loaded with pus, reddish pink or deep buff in color, slightly or not at all offensive.

c. A red fluid like ordinary sterile hæmothorax fluid, but containing bacilli, on culture.

d. A yellow serous fluid containing bacilli on culture.

The offensive odor is the only criterion which can be accepted without further study.

The examination of hæmothorax fluids consists of the immediate microscopic examination of the fluid or the centrifuged product, and the preparation from it of both aerobic and anaerobic cultures. Methylene blue and gram stains are made. Many organisms may be found in the examination of these hæmothorax fluids; however, the strong gram positive bacilli are the gas-producing organisms. The examination of morphological features in a film is never sufficient for their identification but must be supplemented by cultural test. Both aerobic and anaerobic cultures are made.

The gas-producing organisms of most importance are the bacillus perfringens and bacillus sporogenes.

The clinical features of these septic hæmothorax cases may be classified under three heads: (1) those indicating a general toxic action on the patient of the septic substances produced; (2) those caused by inflammation of the pleural cavity; (3) the special physical signs within the chest.

Jaundice, especially if associated with epistaxis, is an index of a very severe type of infection by anaerobes.

The forms of infections of a hæmothorax by the anaerobic gas bacilli fall clinically into five groups which are differentiated by the predominance of toxic symptoms or of the features of gas formation respectively.

These may be fatal in two or three days.

The conclusions are:

1. Infection by anaerobic bacilli occurs in about 10 per cent of all cases of hæmothorax from gunshot wounds of the chest.

2. The infection leads to the development of malodorous gas.

3. In the majority of cases the septic features are much more prominent than gas formation.

4. Diagnosis depends upon exploratory puncture.

5. Life can be saved in at least 80 per cent of the cases if the infected blood is drained away.

V. C. HUNT.

Elmendorf: Venous Re-infusion of Blood Extracted from the Pleural Cavity in Hæmothorax. *Muenchen. med. Wchnschr.*, 1917, lxiv, No. 1.

In general in pulmonary wounds there is either sudden death from hæmorrhage of a large vessel or a rapid and notable amelioration after hæmorrhage from the lesser pulmonary vessels even if the manifestations are at first alarming.

Elmendorf includes a third series, viz., those which succumb within one to four hours after injury with clear symptoms of oxygen deficiency; there is the impression that the intrapleural hæmorrhage is completely arrested; the pulse though very small remains always regular. For such cases the procedure which he describes is very opportune. This was carried out in the following case in which there was no doubt as to the diagnosis—hæmothorax of the right pleural cavity.

The patient who was seen immediately after injury was placed in a position of complete repose for an hour. The hæmorrhage did not seem to progress nor the pulse to grow worse, but anæmia was threatening and the respiratory movements were painful.

After sterilization of the site a puncture was made between the fifth and sixth ribs approximately in the course of the axillary line media. Within 15 minutes there was withdrawn about 300 ccm. of blood, which was immediately infused in a vein near the elbow, the blood being first filtered through a sterile compress. At the commencement of the infusion, about 100 ccm. of physiologic salt solution were infused, which was relatively small but being the patient's own blood a certain amount of therapeutic success was anticipated.

Immediately after the infusion the patient showed renewed vitality, and the subsequent course was very favorable.

During the first three days the expectoration was mixed with fresh blood, but this soon subsided.

The author reports this case merely to demonstrate that the reinfusion of the patient's own blood after puncture of a recent hæmothorax can be done. The use of the method will depend on conditions, especially when no other means of intervening are available, as in men severely wounded near the firing line, it offers a means of saving life which may be executed by one not specially experienced in surgery.

W. A. BRENNAN.

Moreau, L.: Differential Diagnosis of Purulent Pleurisy and Liver Abscess (*Pleurésie purulente et abces du foie; diagnostic différentiel*). *J. de méd. de Bordeaux*, 1917, lxxxviii, 109.

The author enumerates some of the difficulties to be encountered in making a differential diagnosis between an abscess of the liver and purulent pleurisy.

Among the helpful points he gives: The form of the dome over the site of the lesion. It is situated lower in hepatitis and is less marked in pleurisy. Its external aspect is dome-like in hepatitis but parabolic in pleurisy. Dullness on percussion is an important sign. A hypertrophied liver is generally accompanied by a zone of excessive dullness which suggests a pleural effusion.

If the patient expectorates, an abscess of the liver may be deduced from the aspect of the sputum, chocolate in color with reddish débris.

Urinalysis often shows an increase of urea and urates in pleurisy and a notable decrease in hepatitis. But the most reliable mode of investigation is puncture. The exploring needle pushed through an intercostal space will draw reddish pus sometimes colored by bile; the pus of an empyema or of a subphrenic pyothorax will be grey or greenish white. Laboratory examination of the pus will furnish important evidence.

The methods of deviation of complement with antigen of hepatic pus, also the radioscopic screen, are further means to be used in making a differential diagnosis.

W. A. BRENNAN.

Ceresole, G.: Projectiles in the Pleural Cavity; Different Behavior of the Pleura According to the Form of the Projectile (Proiettili in cavità pleurica; diverso comportamento della pleura secondo la forma del proiettile.) *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 51.

From the clinical and radioscopic examination of three cases the author states that, quite independently of any pleural inflammatory process, the pleura may in the presence of a foreign body with a rough uneven surface originate an aseptic reaction capable of organized products which will encapsulate the foreign body; but that when such foreign body has a smooth and aseptic surface such reaction on the part of the pleura is lacking, and the body remains free in the pleural cavity.

W. A. BRENNAN.

Skillern, P. G., Jr.: A Case of Syphilitic Pleurisy with Effusion; Resection of Rib with Drainage. *Med. & Surg.*, 1917, i, 392.

An interesting example of the above condition is reported as occurring in a male, colored, aged 33 years, in whose history there was nothing typical of tuberculosis nor pyogenic infection.

The patient's state of well being, during the period of observation, was striking and suggested the cold, passive process, such as is indicated in syphilis. In the differential diagnosis, tuberculous affections of the pleura chiefly come into question when syphilis is the cause of the pleuritis. The history and physical examination are probably negative for tuberculosis, but positive for syphilis, including the Wassermann reaction on both blood and aspirated pleural fluid. Aspirated pleural fluid, when injected into guinea pigs, will not cause tuberculous lesions, but this is of negative value only.

In reviewing this case, the author believes that several legitimate questions may arise in the reader's mind. First, If the lesion was syphilitic, why was no attempt made to cure it without operation, by an intensive course of antisyphilitic therapy? Second, Why was the pleural fluid not examined from the standpoint of tuberculosis? These questions Skillern attempts to answer.

The patient is now receiving antisyphilitic treatment and is making a very favorable recovery.

E. C. ROBITSHEK.

TRACHEA AND LUNGS

Petit de la Villeon, E.: Extraction of Intrapulmonary Projectiles Under the Screen (L'extraction des projectiles intrapulmonaires à la pince sous écran). *Presse méd.*, 1917, p. 301.

Petit de la Villeon's experiences are based on 200 operations for the extraction of 230 intrapulmonary projectiles. All recovered except one, and in most cases the recovery was rapid after extraction.

The forceps extraction under screen control is the adaptation of general radio-operative methods to pulmonary surgery. The entrance of X-ray not only into diagnosis but also into operative procedures has given surgery a new turn. Instead of the older methods of large open dissections there is now what may be termed the economic radio-operative method, economical because it avoids unnecessary opening up and unnecessary surgical procedures.

To the objection that the method is blind and non-anatomical it may be replied that the contrary is the fact. A thorough practical knowledge of regional anatomy as well as the acquired ability to "see" under the screen is necessary. This is essential to pick out the organs involved as well as the best and safest route of approach to the projectile by a simple and economic operation.

The author gives the technique and indications for the removal of intrapulmonary projectiles. The contra-indications to the radio-operative method are: (1) projectiles situated in the hilum region of the lung; (2) very voluminous projectiles or fragments; (3) when there is an abscess around the projectile.

In the case of projectiles in the hilum region the author practices inter-omo-vertebral thoracopneumotomy in three stages, which he describes in detail.

W. A. BRENNAN.

Lilienthal, H.: The Relation of Radiography to the Diagnosis and Therapy of Non-tuberculous Diseases of the Lungs and Pleura. *Med. Rec.*, 1917, xci, 587.

As a surgeon the author believes that roentgenology of the chest is the cornerstone of modern endothoracic operative therapy. It not only localizes the lesion but determines its nature. Its findings should be correlated with the clinical his-

tory and physical signs and often checked up by bronchoscopy. In purulent pleuritis it is of particular value inasmuch as it indicates the site for operation and frequently gives valuable information as to the kind of operation required. By showing

the presence of metastases in the lungs it may prevent useless operation for malignancies elsewhere. In the radical surgery of non-tuberculous pulmonary suppuration the aid furnished by the roentgen ray is of great value.

ADOLPH HARTUNG.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hartmann, H.: Partial Rupture of the Rectus Abdominal Muscles (La rupture partielle des muscles droits de l'abdomen). *Presse méd.*, 1917, p. 24.

Hartmann reports two cases of partial rupture of the abdominal rectus muscles. One of these cases is interesting in so far as the symptoms led to a diagnostic error. The patient was a woman of 56 who came to the hospital with a diagnosis of appendicitis. Further examination and observation led Hartmann to the diagnosis of a small ovarian cyst with twisted pedicle and the symptoms of peritonitis which had been manifested were believed to be due to this. On opening the abdomen by a median incision the peritoneum showed no sign of inflammation. On making a branch transverse incision, the author found toward the edge of the right rectus a collection of serosanguinous fluid and the existence of a hæmatoma in the deep face of the muscle. The deep part of the rectus was partially ruptured, giving rise to reflex phenomena which caused the peritoneal syndrome which the patient had exhibited on her admission to the hospital. Hartmann deduces that symptoms of peritonitis may result from an irritation of the external face of the peritoneum without there being the least inflammatory reaction on the serous face.

W. A. BRENNAN.

Medina, A. J., and Egana, A. R.: Primary Sarcoma of the Stomach (Sarcoma primitivo del estomago). *Rev. Asoc. méd. argent.*, 1917, xxvi, 399.

The authors report a case of subtotal gastrectomy in a man, aged 37, for primary sarcoma of the stomach. The patient has lived eighteen months since operation without any evidence of recurrence. The tumor was situated on the small curvature of the stomach involving the anterior and posterior faces. The resection of the stomach was done according to the Mickulicz technique and was followed by an anterior pre-colic gastro-enterostomy. A year after intervention the general state was good; digestion easy; no epigastric pain; good appetite; ordinary avocation attended to. Macroscopically the removed tumor was the size of an ostrich egg, developed in the thickness of the gastric walls involving the small curvature on the anterior and posterior faces and situated to the left of the pylorus which was intact. There were four small ulcerations in the mucosa; the serosa was healthy and normal. The gastric walls were greatly thickened, as much as 3 cm. in places. Of four different pathologists,

three diagnosed the growth as globocellular small-celled sarcoma; one as fibrosarcoma.

There are 180 cases of primary sarcoma of the stomach in the literature, but, according to the authors, this is the first case reported in Argentine.

W. A. BRENNAN.

Dauriac: A Case of Ægagropilus (Hairy Tumor of the Stomach) (Un beau cas d'ægagropile [tumeur pileuse de l'estomac]). *Bull. Acad. de méd. de Par.*, 1917, lxxvii, 532.

A girl of 13 years came to the author showing a meteoric abdomen and the subdiaphragmatic region occupied by a hard lignous tumor, mobile transversely only. It descended to within four finger-widths of the umbilicus. Different diagnoses were made, sarcoma, mesenteric tumor, etc. No radiographs were possible.

A median laparotomy was done. The stomach seemed to be transformed into a solid tumor. Its walls were quite adherent to the mass which they enclosed. The case was believed to be gastric sarcoma, and under the circumstances the author executed a total gastrectomy, joining the cardia to the pylorus or rather into the duodenal end. The postoperative course was benign. The child was able to eat after twenty-four hours.

The tumor consisted of a mass of black hair extremely matted and the exact model of the stomach and first part of duodenum. It weighed 820 grams and was 690 ccm. in volume. The stomachal mucus was ulcerated in front and toward the small curvature. Hairs still remained implanted in the mucus after removal of the tumor.

It appeared that the child had the habit of eating her hair at night since a very young age. Since the operation her appetite, eating, and stools are regular.

W. A. BRENNAN.

Baldo Rossi: The Treatment of Abdominal Wounds in War (Contributo alla cura delle lesioni addominali di guerra). *Clin. chir.*, Milano, 1917, xxiv, 1387.

The author, a director of an Italian surgical ambulance at the front, has treated 171 cases of abdominal wounds, 124 of which were penetrating wounds. The clinical histories of the cases are given, and the author considers the indications for operative intervention in abdominal wounds. He demonstrates that if lesions of the hollow viscera are not operated upon death is certain to follow; while if operated the percentage of recovery is at least 30 per cent. It is evident therefore that inter-

vention is indicated in all cases except in such as are certain to die owing to their condition, and cases in which although there are certain penetrations, only the peritoneum or the parenchymatous structures are injured. In the latter class if there are signs of hæmorrhage the author advises intervention.

The following statistics are given:

	No. of Cases	Dead	Cured	Per Cent of Cures
NON-PENETRATING WOUNDS				
1. Parietal wounds.....	25	2	23	92
2. Extra-peritoneal thoraco-abdominal wounds.....	11	4	7	63.6
3. Visceral wounds.....	8	3	5	62.5
4. Thoraco-abdominal wounds with lesions of extra-peritoneal structures.....	3	0	3	100
	47	9	38	
PENETRATING WOUNDS				
1. Without visceral or with parenchymatous lesions and operated.				
a. Wounds limited to the abdomen.....	7	0	7	100
b. Thoraco-abdominal wounds.....	3	0	3	100
2. With visceral lesions and operated.				
a. Wounds limited to abdomen.....	66	44	22	33
b. Thoraco-abdominal wounds.....	17	9	8	47
3. With inoperable visceral lesions.....	31	31	0	0
	124	84	40	

W. A. BRENNAN.

Ortali, O.: Suture of the Diaphragm for Gunshot Wound with Hernia of Omentum and Transverse Colon. *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 369.

Wounds of the diaphragm observed in peace time are usually on the left side as they are produced by cutting or pointed weapons in the right hand of the striker. But war gunshot diaphragmatic injuries occur on both sides. One of the gravest complications of such wounds is the hernia of abdominal viscera. The author reports such a case in which omentum and transverse colon had herniated. The former was resected after a breach was made by resecting a rib and the intestine reduced to its place. The ruptured diaphragm was sutured with silk. In this case the diagnosis of diaphragmatic rupture was made easy by the fact that a piece of omentum projected through the external wound.

W. A. BRENNAN.

Walther, C.: Enormous Strangulated Umbilical Hernia Containing a Large Pedunculated Fibroma (Enorme hernie ombilicale étranglée contenant un gros fibrome pédiculé). *Bull. et mém. Soc. de chir. de Par.*, 1917, xlii, 933.

The case of umbilical hernia reported by Walther occurred in a woman of 60 years. Examination showed an immense abdominal tumor, pedunculated and dragging down all the abdominal wall. It was cylindrical in shape, measuring about 25 cm. in width at its middle part, the circumference near the

pedicle being 52 cm. The pedicle was situated about 22 cm. below the iliac spines. The surface of the tumor showed three distinct projecting bosses, one posterior projecting between the thighs, the other two being lateral and anterior and separated by a slight median depression. The tumor dated from the age of 15, but gave no trouble other than a sensation of weight. It had gradually increased in size and was supported by a binder.

On operating Walther found the transverse colon and several loops of small intestine in the mass. These having been freed, it was seen that at the lower part of the eventration a large pedicle was attached to a solid mass which constituted the greater part of the tumor. The tumor was a large fibroma and the pedicle was formed by the uterus so strongly stretched that it was about 15 cm. long. The fibroma itself had no pedicle. It was situated on a width of 5 cm. at the right cornua and weighed 5.2 pounds, 370 grams.

W. A. BRENNAN.

Alessandri, R.: Left-sided, Non-traumatic Acquired Diaphragmatic Hernia (Ernia diaframmatica acquisita non-traumatica sinistra). *Policlin.*, Roma, 1917, xxiv, sez. prat., 657.

True non-traumatic acquired hernia is rare. In the case reported by the author in a man of 37 years the symptoms became apparent during military service. There was no trauma, but after eating the man was seized with stomach pains and vomited food. These symptoms were repeated at each meal and relief was only given by gastric lavage. This condition had continued for fifteen years. There was no defecation disturbance; no hæmatemesis; no melæna. Radiology disclosed a voluminous diaphragmatic hernia containing a large part of the stomach and part of the transverse colon. The eighth, ninth, and tenth ribs were resected and the pleural cul-de-sac separated from the hernial tumefaction which was in a true sac. This being opened was found to include the whole inferior segment of the stomach including the pylorus, a part of the transverse colon and adherent omentum. The hernial aperture, about 6 to 7 cm. wide, was sutured in two planes after reduction of the viscera. The patient recovered. Regarding pathogenesis the author assumes a congenital predisposition, due perhaps to an abnormal width of Bogdalek's foramen.

W. A. BRENNAN.

Simoncelli, G.: A Case of Strangulated Diaphragmatic Hernia (Sopra un caso di ernia diaframmatica strozzata). *Policlin.*, Roma, 1917, xxiv, sez. chir., 174.

Simoncelli describes a case in which a man was seized with acute abdominal symptoms after eating. He was removed to the hospital and upon examination, although the complex symptoms were rather doubtful, a diagnosis of intestinal occlusion was made, especially based on the impossibility of passage of either fæces or gas. The condition suddenly became very grave, the pulse almost imper-

ceptible; intervention was impossible and the man died. Autopsy showed a globular mass, about the size of a foetal head at term, consisting of a loop of colon and almost all the great omentum herniated into the thoracic cavity. The hernial orifice was situated about 2 cm. from the left external limit of the diaphragmatic cupola between the phrenic center and the fleshy part of the diaphragm. The orifice was constituted of a hard cicatricial band which tightly bound the herniated mass and through which it was impossible to reduce it.

It appeared that about three years before the man had received a stab wound in the left side of the breast. The weapon had evidently penetrated the diaphragm and caused the hernia which had continued and permitted an apparent condition of well-being so long as the canalization of the herniated intestinal loop continued free.

The author points out that this late development is not rare. Lacher has collected 36 cases of lesions of the diaphragm not operatively treated, in 5 of which death occurred within a few days, in 10 within a month, in 5 within five years, and in 5 within twenty years after, all in consequence of a diaphragmatic hernia. The symptoms of strangulation in the majority of cases became manifest only after a long interval.

W. A. BRENNAN.

Forshaw, W. H.: Case of Suprapubic Hernia.
Lancet, Lond., 1917, cxcii, 998.

A married woman, aged 41, in the act of micturition, felt a sharp pain above the symphysis pubis with development of a lump in that region, accompanied by vomiting. On admission to the hospital twenty-four hours later there was a hard, rounded swelling the size of a doubled forefinger just above the symphysis in front of the right rectus muscle; no impulse. Operation disclosed a strangulated hernia between the two recti muscles very near their insertions. The gut was returned and the sac cut away. Uninterrupted convalescence followed.

V. C. HUNT.

Bailleul, and Picot, G.: Fascia Lata Graft for Muscular Hernia, etc. (Fascia lata pour hernies musculaires, etc.). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 950.

The reports submitted by Bailleul and Picot refer to the use of fascia lata grafts for musculocutaneous adhesive cicatrices, 6 cases; muscular and visceral herniæ, 18 cases; covering nerves, 5 cases; and for the reconstitution of tendons with an extensive loss of substance, 4 cases.

In muscular herniæ the fascia lata graft has given good results in the authors' experience, and this graft is absolutely indicated. In musculocutaneous adhesions, after freeing the adhesion Bailleul applied the graft; the results were good and the muscle functioned after operation although it was impotent before.

As a covering and isolating membrane of nerve the result was good as in other cases. There is no

doubt that the indication for fascia lata graft is very clear in tendinous reparations.

In submitting these reports, Mauclair mentioned that he himself had practiced aponeurotic grafts in 20 cases of visceral herniæ, not always with satisfactory results, as owing to the weakness of the wall the graft is likely to distend.

Although the applications of the fascia lata graft are numerous too much must not be expected from it, for instance in using it in superimposed layers.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Escudero, P., and Finochietto, E.: New Surgical Treatment of Gastric and Duodenal Ulcers (Nuevo tratamiento quirúrgico de las úlceras gástricas y duodenales). *Prensa méd. argent.*, 1917, iii, 365.

In August, 1916, the authors instituted a new surgical procedure in a patient with chronic non-stenosed ulcer of the first part of the duodenum. The report of this case is premised by the statement that gastro-enterostomy is the surgical treatment of choice in this condition but the functional results vary considerably. Hyperacidity usually becomes hypo-acidity in satisfactory cases, and the authors believe with others that the presence of bile in the stomach of an operated patient plays an important part in the result of a favorable gastro-enterostomy. Realizing the importance of this they sought for a method of bringing it about without in any way modifying the gastro-intestinal functioning. This was effected by establishing a cholecystogastric fistula. This operation according to the authors respects the gastroduodenal functioning, permits flow of bile to the duodenum by the natural channels, and merely allows its presence during gastric digestion. It is a benign and easy operation, and does not interfere with a later gastro-enterostomy if deemed necessary.

The authors have practiced this operation in one case of duodenal ulcer. It is now 5.5 months since the operation and the results are excellent. The full clinical details will be published later. In this case hydrochloric acid has been reduced from 2.25 to c.46. The patient's weight has increased 9 kilos since the operation. The stomach empties in six hours, and the flow of bile depends on the ingress of food.

W. A. BRENNAN.

Wilensky, A. O., and Crohn, B. B.: Studies in the Physiology and Pathology of the Stomach after Gastro-Enterostomy. *Am. J. Med. Sc.*, 1917, cliii, 808.

By careful analysis of the data which they have so far collected, the authors have separated their cases into groups: one based upon the clinical symptoms, another upon the chemical findings, and a third, upon a study of gastro-motor mechanism in the hunger state by means of kymographic tracings. For this last they have made use of the physiological

methods employed by Cannon and Carlson and have controlled their observations by radiographic examinations made by Jaches and his associates.

Their studies comprise the analysis of 37 cases of ulcer of the stomach and duodenum, in which posterior retrocolic gastrojejunostomy had been made. In all of these cases the ulcer-bearing area had been excluded by the string method or by pyloric plication or had been removed by local excision, pylorotomy, or by partial gastrectomy. The clinical symptoms following the operation are of various kinds but fall naturally and readily, according to the authors, into three groups:

1. Group A comprises cases that do well after operation and have few or trivial symptoms. Careful supervision of the postoperative diet of these patients, particularly with regard to the curtailment of the amount of the alimentation, restores them to health. There were 11 of these cases in the authors' series.

2. Group B includes 14 cases in which, following operation, it was possible to demonstrate definite disturbances in the physiology of the stomach, as exemplified in the secretory and motor functions. Clinically, the patient complained of definite, dull, pressing or cramp-like pain, felt in the epigastric, substernal, or hypochondriac regions, and, very often, lower down in the peri-umbilical region or in the iliac fossæ. Vomiting is frequent; often repeated more than once daily after taking food; less frequently, it occurs once a day and then usually in the morning; the vomitus is not copious and consists of sour, biliary material; food is frequently avoided, because of the pain it brings on; there may be increase in weight, soon replaced by a loss; the bowels are usually constipated, but occasionally attacks of diarrhoea may intervene; mental depression is frequently a pronounced symptom; there are practically no physical signs.

3. Group C. Comprises cases in which mechanical disturbances in the function of the gastrojejunal stoma are present. There were 7 of these cases. Two were gastric ulcers and the remaining 5 were gradually produced organic contractions of the stoma. The symptoms complained of were very similar to those in Group B. The differentiation between Group B and Group C consists in the fact that, in the former group, there are functional disturbances and in the latter, organic mechanical faults. In discussing the chemism of the stomach after operation for ulcer the authors follow the same group classification as heretofore described.

In a résumé of the dominant characteristics of these groups, obtained by the various means at their disposal, the authors recall that 37 cases have been examined to ascertain the functional activity of the stomach after gastrojejunostomy, as performed by competent surgeons, employing a technique uniformly accepted today. Of these cases, 11 fall in Group A. These have all been regarded as well. Clinically, they have few or trivial complaints. Chemical examinations demonstrate a

mildly diminished motility after Ewald's or Riegel's test meals, with diminished acidity and a moderate but distinct and persistent hypersecretion. The fractional method of Reyfuss shows a nearly normal curve. Kymographic tracings show moderate diminution in the tone, but in about one-half of the cases a return to normal occurs very shortly. The roentgen ray fails to show a six-hour residue and the stoma functionates properly.

The next 14 cases, in Group B, remain poorly nourished and complain of the following symptoms: vomiting; often hæmatemesis: constipation or, rarely, diarrhoea. These cases are all depressed mentally; chemically definite delay in motility is shown and hypersecretion is present. The stomata functionates poorly.

The kymographic tracings show either a complete absence or a marked diminution of the peristaltic tone, and the normal hunger contractions are not regained. The radiograph shows the stoma to be functioning improperly and the peristalsis is noted as active or very active. This group of cases is characterized mainly by disturbed muscular functions leading to inefficiency to a still patent stoma with definite delay in gastric motility.

The third group comprises 7 cases of organic stenosis of the stoma. Clinically, they resemble the preceding groups. Chemically, they show even a greater degree of gastric retention and delayed motility. By the kymograph they may be shown to have gained a good peristaltic tone. Radiographically, they show violent peristalsis, six-hour residue, and inefficient and closed stomata.

The authors conclude that this operation leaves the stomach definitely impaired in its functional efficiency in a large percentage of cases. It disturbs the peristaltic tone of the stomach, the secretory functions, and the nervous mechanism controlling both. In only a minimum of cases does the stomach return to an almost normal state of functional activity.

How great a factor pyloric exclusion plays in this disturbance the authors are not able to estimate with any degree of accuracy. They urge the surgeon to avoid undertaking gastrojejunostomy in cases in which no definite organic lesions are demonstrable in the stomach at operation, since such cases are the kind that show the greatest amount of disturbance of function following operation.

E. C. ROBITSHEK.

Strauss, A. A.: Reconstruction of the Pylorus and Pyloric Antrum by two Superimposed Fascial Transplants After Excision of Pyloric Ulcer.
J. Am. M. Ass., 1917, lxxviii, 1397.

Strauss states that while he believes the principle of excising pyloric ulcer is correct, in his opinion to excise the ulcer and with it take the most important part of the stomach, as is done in pylorotomy, is wrong.

By the first method, a right rectus incision is made one-half inch to the right of the midline, ex-

tending from the angle of the ribs down to the umbilicus. The anterior sheath of the rectus is exposed and an oval flap about 1 to 1.5 inches in length and about 1 to 1.5 inches in width secured. In resecting this a thin, adherent layer of muscle-fibers from the rectus muscles is taken with it. The rest of the abdominal wall is then divided and the peritoneum opened. The forceps are placed on the inner portion of the divided abdominal wall and the peritoneum with its transversalis fascia and muscle is pulled upward and divided which forms Transplant 2.

The stomach is next brought into view. The pyloric portion in which the ulcer occurs is tightly grasped between the thumb and index-finger and an elliptic incision is made around the ulcer through the muscularis down to the mucosa. The mucosa is separated from the muscularis beyond the surrounding infiltrated area of the ulcer. A stomach clamp is then applied and the ulcer with its surrounding infiltrated area cut away.

Transplant 2 is then sutured by an end-to-end suture with fine chromic catgut to the mucosa, the peritoneum corresponding to the mucosa. The first transplant is then sutured to the muscularis with interrupted silk sutures similar to the Andrews imbrication method, the sutures being placed through the edges of the transplant in such a manner that the transplant is between the mucosa and the muscularis with the muscularis overlapping it.

A second suture, which, however, is not absolutely necessary, is placed around the inner edge of this transplant and muscularis. The free edge of the attached omentum is then sutured over this entire area with a few interrupted catgut sutures. This part of the procedure not only acts as a means of preventing hæmorrhage, leakage, and adhesions, but it also does something far more important: it vitalizes the fascial transplant.

Thirty-four animals were operated upon in the last three years by this method, four of which died within six to eight days following the operation. Necropsy revealed a peritonitis which, however, was not due to any leakage from the area of operation. All of the 30 animals that lived made uneventful recoveries and acted, shortly after operation, like normal animals. Roentgenograms were taken from time to time from six weeks to one year following operation. All showed a normally functioning pylorus. The animals were killed from six to fourteen months after operation and all showed the stomach to be normal in size and both ends patent. Microscopic sections were also made.

With the second method the technique has been changed within the past year, making a plastic operation on the mucosa and using only one transplant, thus: An incision around the ulcer down to the mucosa is made as in the first method, with the exception that the incision is carried back on the body of the stomach for a distance of two inches and the mucosa thoroughly freed from the muscularis around one-half of the circumference of that por-

tion of the stomach. The ulcer is then cut away as in the former procedure.

A transverse incision is made in the mucosa and sutured longitudinally, which allows the mucosa to come forward where the ulcer is cut away, so that it can be easily sutured transversely. The fascial transplant is then set in, and covered by omentum as in the former procedure. The same procedure has been carried out on the duodenum with equal success.

Ulcers are produced experimentally and this procedure carried out with good success.

The conclusions are as follows:

1. Three years' experience with this method has proved it to be an absolutely safe procedure.
2. In view of the relationship of ulcer to cancer, and the fact that it probably is a localized lesion produced by streptococcus infection, this method of excision seems far more rational than gastro-enterostomy with or without pyloric closure.
3. The operation leaves the stomach in its normal anatomic condition and physiologic relationship, and does not mutilate the organ or cut away any of its most important parts.
4. The operation takes far less surgical skill, produces much less shock, and takes less time than a simple gastro-enterostomy.
5. The vitalization of the free fascial transplants by the free edge of the great omentum, in both a clean and an infected field, has been proved both experimentally and clinically.
6. The closing over of a perforated ulcer by a free fascial transplant and the attached omentum is far safer and more permanent than a purse-string suture placed in the indurated area of an ulcer.

CARL R. STEINKE.

Basch, S.: Diverticulum of the Duodenum; Report of a Case Diagnosed During Life and Successfully Operated on. *Am. J. Med. Sc.*, 1917, cliii, 833.

The history, roentgen and operative findings, and pathological report of a duodenal diverticulum is supplemented by a synoptic review of the literature on the subject. This rare condition has been diagnosed heretofore only at postmortem and now only by roentgen findings.

The patient, an introspective nervous spinster, 36 years old, gave a history of marked constipation persisting since childhood, with distention and acid belching, especially after acid diet, mucous stools, and a sharp pain below the gall-bladder an hour or two after meals. These symptoms were uninfluenced by the removal of an inflamed appendix and the operative correction of a rectal fissure.

Physical examination was negative except for exaggerated reflexes, an aortic stenotic murmur, general visceroptosis, and tenderness over the gall-bladder with the pain on pressure referred to the right nipple. Gastric acidity and motility were normal. The feces, acid and unformed, showed poor starch digestion and much mucus but no blood

nor abnormal bile. A tentative diagnosis of chronic duodenal ulcer with adhesions or gall-bladder involvement was made.

Variations from normal gastric roentgen findings were: very active peristalsis, a large and distended bulbous duodeni, apparent adhesions of the first and second portions of the duodenum to the liver, and a bismuth-filled dilatation at the beginning of the third part of the duodenum, which pouch cast a shadow for ninety-six hours.

Operation showed no ulcer of the stomach or duodenum but showed the first and second portions of the latter congested and adherent and the second portion much dilated and hypertrophied. Operative exposure showed the third part of the duodenum normal in size but displaying a diverticulum attached to the angle between the second and third parts. The diverticulum was excised at its base, lengthwise of the gut, and the opening in the duodenum was closed in the transverse direction; such closure resulted in no narrowing of the duodenum. A posterior gastro-enterostomy was performed because of the periduodenal adhesions and duodenal dilatation. There has been a good primary recovery and decided digestive improvement.

The diverticulum measured 3 x 4 cm. and was 3 cm. across the base. It was thin walled with intact serous and muscular coats; defects in the mucosa proved to be artefacts only.

The author has found but one similar case in the literature of a duodenal diverticulum diagnosed during life and successfully operated upon, and but 65 to 70 cases reported at all. For the following facts he acknowledges indebtedness to Buschi's study in 1911.

Chomel in 1707 reported finding at postmortem a duodenal diverticulum in a patient who had complained of pain at its site two hours after meals. However, Morgagni in 1839 was the first to really describe the condition.

Duodenal diverticula are found twice as often in males as in females, and three times as often in the second portion of the duodenum as in the first and third combined. They are usually single, though as many as five may be present in a given case. Usually they are composed of the mucous and submucous coats. They may be spherical, hemispherical, or the shape of a glove finger. They may be sessile or constricted at the attachment to the gut and may vary from a few millimeters to 5 cm. in the greatest diameter. Their usual site is on the inner surface of the duodenum, in close proximity to the pancreatic head and ducts. Their origin is still a matter of speculation, Buschi regarding them in the main as congenital.

Bauer's report of two cases in 1912 gave point to the clinical significance of duodenal diverticula. In the first case, postmortem following gastro-enterostomy for pyloric obstruction showed two duodenal diverticula, one involving the common bile and Wirsung ducts; Bauer believed that this when full caused stenosis of the pylorus and duodenum.

Postmortem examination of Bauer's second case and two of Wilkie's cases showed inflammation of the duodenum and adjacent structures, possibly though not definitely secondary to the conditions in the diverticula. Furthermore, roentgen and clinical study of the author's case and that of Forsell and Key showed that duodenal contents entering these pouches can give rise to marked secondary symptoms.

Duodenal diverticula cannot be diagnosed during life unless the sac be such as to throw a shadow in roentgen examination; also, from their location, exploratory laparotomy does not reveal them and even postmortem examination may not unless they are especially sought for. From these facts the author is led to surmise that ulcer clinically suspected, but not found on exploration, may be one of these diverticula or an ulcer located in the second or third part of the duodenum. He concludes:

1. Duodenal diverticula are more frequent than reported.
2. Unless specially sought for they are easily overlooked at operation or autopsy.
3. They can be diagnosed by roentgen-ray examination when they form distinct pouches.
4. They may produce symptoms sufficient to require surgical interference.
5. They can be cured by operation.

JESSE D. COOK.

Einhorn, M.: Importance of Duodenal Alimentation in Severe Dyspepsia Occurring After Gastro-Enterostomy. *Med. Rec.*, 1917, xci, 1023.

Within the last few years the author has had a considerable number of cases of severe dyspepsia, following gastro-enterostomy. He has kept in touch with 10 of these cases, and the records are presented in tabular form.

Of these patients, 8 treated by duodenal alimentation made complete recovery, not requiring surgical aid; of the other 2, one felt considerably improved during the period of duodenal alimentation, but, as soon as the tube was removed and nourishment given in the usual way, the pains returned. A provisional diagnosis of severe adhesions with perigastritis was made, and it was necessary to re-operate the wound. The diagnosis was corroborated by the laparotomy and an anterior gastro-enterostomy was performed. The other patient also derived considerable benefit from the duodenal alimentation for several months, but the formation of a new ulcer with hæmorrhage, necessitated surgical intervention.

Einhorn believes that the peptic ulceration in the stomach or jejunum, in the vicinity of the new stoma or adhesions, are the most frequent conditions and disturbances following gastro-enterostomy. The most prominent symptoms, he claims, are pain, vomiting, and hæmorrhages. In the treatment, liquid diet, large doses of bismuth, and washing the stomach, play important parts. Occasionally, however, all of these measures fail, many of these

patients having to undergo another operation, frequently with indefinite results as to the future.

It is in exactly this class of cases that he frequently finds duodenal, or, more correctly speaking, jejunal, alimentation to be of great benefit.

It is best, according to the author, to make a thorough analysis of these cases with regard to the gastric secretion and food retention; emphasis is laid upon the value of examination with the duodenal bucket. The string attached to the bucket shows whether there is a patent opening leading into the duodenum or jejunum, whether these be ulceration at stoma, and, ultimately, whether the bucket has passed through the pylorus or through the new opening. The presence of a blood stain on the string below 18 or 19 inches, speaks for ulceration near the stoma. If a yellowish discoloration (bile) appears on the string, beginning at about 23 inches or farther down, it usually indicates that the bucket has passed through the pylorus. If the yellowish discoloration begins at 19 or 20 inches, it indicates that the bucket has passed through the new opening. Should there be a yellowish discoloration on the string up to 16 or 17 inches, then the question arises as to the patency of either the pylorus or the new stoma. If in doubt as to how far the bucket has gone, X-ray examination with bismuth will be required. In all cases in which the duodenal bucket has reached the duodenum or jejunum, treatment by duodenal or jejunal alimentation may be tried.

E. C. ROBITSHEK.

Redwood, R. V. D.: After-History of Three Cases of Intestinal Obstruction. *Brit. M. J.*, 1917, i, 581.

Three cases of intestinal obstruction are reported briefly as follows:

In the first case, gangrenous intussusception and polypus, resection was performed and lateral anastomosis with Murphy's button. There were no symptoms of obstruction for five years, at which time the patient died of meningitis.

The second case was a gangrenous femoral hernia. In this case an end-to-end anastomosis with Murphy's button was done. There are no signs of stricture up to date.

In the third case, a strangulated hernia, black shiny gut returned just short of the abdomen; perforation took place on the fifth day, the fistula remaining open for three weeks. It is now five years since the operation and no trouble has as yet arisen.

V. C. HUNT.

Sympson, E. M.: Acute Intestinal Obstruction by Meckel's Diverticulum Successfully Treated by Laparotomy. *Lancet*, Lond., 1917, cxcii, 998.

The patient, 21 years of age, was admitted to the hospital with acute intestinal obstruction. Two years previously an operation had been performed, consisting in midline incision with drainage, for acute peritonitis. Two days before admission to the hospital there had been an acute onset of

pain over the entire abdomen accompanied by vomiting, which in twelve hours became stercoraceous with absolute constipation. On admission the patient had "*facies hippocratica*," furred tongue, faecal smelling breath, temperature 97° F., and a feeble pulse of 130. There was evenly distributed distention and tympanites over the abdomen and visible peristalsis and abdominal rigidity.

A midline incision made through the old scar disclosed a greatly distended ileum and many adhesions. After freeing the adhesions the bowel was still distended throughout except toward the ileocaecal junction which was flaccid upward for two feet, where a Meckel's diverticulum four inches long was adherent at its tip to the posterior abdominal wall and to the root of the mesentery, forming an opening through which two feet of ileum had become prolapsed and strangulated. The diverticulum was removed and the abdomen closed. One ccm. of pituitrin was given every eight hours and 1 grain of calomel every hour for ten hours. The bowels were open on the second day and the patient was on a full diet on the fifth day. Convalescence was uneventful and the patient was discharged cured four weeks after admission to the hospital.

V. C. HUNT.

Holt, L. E.: Hypertrophic Stenosis in Infants. *J. Am. M. Ass.*, 1917, lxxviii, 1517.

The data which form the basis of this paper have been derived from a study of 133 cases of pyloric stenosis in infants treated in the wards and private rooms of the Babies' Hospital, and eight cases seen by the author with physicians outside the hospital, making 141 in all. Of the fatal cases, the stomach has been examined at necropsy in 35. Microscopic examinations of the stomach have been made in 12 cases. Of the infants who recovered, 3 have been lost sight of; 10 died subsequently from other conditions; the remaining 64 have been followed up to date, 12 of them for a period of four years or more.

The clinical course and the uniform pathologic findings have convinced the author that a division of cases of pyloric stenosis of infants into spasmodic and hypertrophic types is not admissible.

Hypertrophic stenosis of the pylorus in infancy is a pathologic entity. It should not be confused with other pathologic conditions which may be accompanied by vomiting and occasional gastric peristalsis.

In many of the milder forms, the patients recover with only medical treatment. All those who do not improve under such treatment in the course of two or three weeks should be treated surgically; with the more severe types only a short delay is permissible.

The symptoms which indicate surgical intervention are rapid loss in weight, persistent, forcible vomiting, and active gastric peristalsis. The presence of a palpable tumor and abnormal gastric retention aids much in diagnosis.

The roentgen ray reveals nothing of importance

which cannot be discovered by a study of gastric retention, and without its dangers.

The patients who come under observation after four or five weeks of vomiting and marked loss in weight are best treated by operation as soon as the diagnosis is established.

The earlier operations of gastro-enterostomy, divulsion, pyloroplasty, etc., were unduly severe and prolonged. They should be abandoned for the simple external division of the circular muscular fibers proposed by Rammstedt.

Results by the same operator, on the same class of patients in the same institution and with the same after-treatment, show the great superiority of the Rammstedt operation to gastro-enterostomy and to medical treatment.

Skilled after-treatment is quite as essential to good results as good surgical technique.

Cases of gastro-enterostomy followed from four to eleven years indicate that growth and development are not impaired by the operation.

Cases followed two and three years after the Rammstedt operation show no interference with health and progress.

Patients not operated on usually show no symptoms after the first year. Yet the possibility that this condition may be the basis of pyloric obstruction in later life undoubtedly exists.

EDWARD L. CORNELL.

Guérin: Ileocæcal Tuberculosis (Tuberculose iléo-cæcale). *Lyon méd.*, 1917, CXXVI, 214.

Apropos of six collected cases, including one personal case, of ileocæcal tuberculosis which Guérin gives the details of he says that from the anatomopathological point of view there are three types: (1) cicatricial and ulcerocicatricial characterized by numerous ulcerations situated in the cæcum; (2) hypertrophic tuberculosis, the "true surgical type," in which the cæcum surrounded by a thick layer of sclerolipomatous tissue preserves its form but has the walls much thickened; (3) enteroperitoneal tuberculosis which is generally the culmination of the cicatricial types. As a general rule the three types will be found united in one patient, owing to the fact that the case is not surgically seen until far advanced.

Regarding symptomatology many of those cases are primarily diagnosed as appendicitis. Three of the six cases reported are of this type. The confusion between an ileocæcal bacillosis and appendicitis is sometimes very difficult to avoid, and in cases clinically impossible. The dependence of a tumor from the cæcum and undoubted signs of pulmonary tuberculosis will suggest the diagnosis of ileocæcal tuberculosis.

The author thinks resection the operation of choice. When the tuberculous tumor is completely freed from adherences the section of ascending colon and small intestine between clamps is proceeded with, the small intestine being then either implanted in the ascending colon or a terminolateral anastomo-

sis made. Operation is terminated by hermetic closure of the peritoneum, but in order to avoid suppuration which is usual in operations on the large intestine, the musculo-aponeurotic and cutaneous layers of the operatory wounds are incompletely sutured and drainage gauze inserted.

W. A. BRENNAN.

Llanos, M. A.: Benign Tumors of the Cæcum (Tumores benignos del ciego). *Rev. méd. del Rosario*, 1917, vii, 69.

The literature contains only a few cases of benign tumor of the cæcum. Short histories of these are given and the author describes a personal case of a man of 40 who came to the hospital with a history of digestive trouble and abdominal pain for six months. Palpation disclosed a tumor at the right side about the level of the pylorus. It was painful, about the size of a mandarin orange, irregular, and highly movable. The diagnosis was probable cancer of the pylorus, and a supra-umbilical laparotomy was done. The tumor which was easily exteriorized was found to be in the ileocæcal region; the terminal part of the ileum was invaginated in the cæcum; a solid tumor was found within the latter the size of a small hen egg situated on the anterior-internal face and with a small pedicle. The appendix showed all the macroscopic signs of an accentuated appendicitis. An ileocæcal extirpation with a latero-anastomosis was done. The patient recovered rapidly. Examination of the specimen showed that it was a fibromyxoma.

W. A. BRENNAN.

Pettit, R. T.: The Roentgen Rays in the Diagnosis of Chronic Appendicitis. *Arch. Radiol. & Electrotherap.*, 1917, xxi, 345.

The author calls attention, in a brief way, to the various conditions which may be confused with chronic appendicitis, giving some interesting figures as to errors in diagnosis. In quoting F. G. Connell, a statement is made that out of 212 patients operated upon for chronic appendicitis, 87, or 41 per cent, were not relieved of their symptoms.

The main points considered in diagnosis are: first, pain in the lower right quadrant of the abdomen. This is considered an unreliable sign, since spastic constipation, colitis, enteroptosis, stone in the ureter, ovaritis, and even neurasthenia can produce these same pains. Tenderness over McBurney's point he also considers unreliable, for, as a rule, the appendix is not beneath McBurney's point, this usually being over the ileocæcal valve. He mentions temperature and leucocytosis as an inconstant finding in chronic appendicitis.

By the fluoroscopic study of the barium-filled colon, the author demonstrates that it is possible to accurately determine the point of tenderness and pain as to whether it involves the ileocæcal region and appendix or the cæcum or some point distant from the appendix. The mobility of the cæcum is absolutely determined, as is also the question of visceroptosis, spastic colitis, or ileac

stasis. The author cites four cases to illustrate his contention that the roentgen method of diagnosing a chronic appendix is the most reliable.

In conclusion, the author states that a roentgen examination should be made of every case of chronic abdominal pathology, before operation.

W. A. EVANS.

McMeans, J. W.: Experimental Appendicitis.
Arch. Int. Med., 1917, xix, 709.

In view of the widespread lesions in human bacteremia the author studied the effects on rabbits of intravenous injections of micro-organisms with special reference to appendiceal lesions. Material was obtained from appendices, tonsils (healthy and diseased), and from pus from an infected hand.

The results of the study are as follows:

1. Tonsil culture in an acute ulcerative appendicitis case, streptococcus salivarius isolated. Subcultures from the knee-joint, periarticular tissues, and peritoneum and heart blood of inoculated animals also used.

Lesions in the appendix followed intravenous injections of streptococcus salivarius from the sources named. There was marked variation in the order in which organs were invaded. The organism did not lose its power of attacking appendices, as was shown by the fact that five out of twelve rabbits had appendiceal lesions 30 days after the original isolation.

2. Tonsil culture—4 cases of appendicitis— injected into ten rabbits produced appendiceal lesions in five.

With a total of 35 rabbits injected with organisms from the tonsils of appendix patients 16 developed appendiceal lesions. Of these, 11 were injected intravenously, 4 into the appendiceal artery and 1 into the lumen of the appendix. Even when injected into the appendiceal artery there was little tendency to exclusive localization in the appendix.

3. Appendix cultures:

(a) Normal—bacillus coli communis—streptococcus mitis; streptococcus equinus, influenza like bacillus—10 rabbits with 3 appendices affected.

(b) Acute ulcerative—bacillus faecalis, bacillus coli communis, and communis staphylococcus albus—4 rabbits with no appendix affected.

(c) Acute gangrenous—bacillus lactici acidi, staphylococcus albus—7 rabbits with 6 appendiceal lesions.

(d) Chronic appendix—bacillus acidi lactici, staphylococcus albus, pneumococcus, bacillus coli communis, bacillus xerosis—8 rabbits with 4 appendiceal lesions.

(e) Appendix abscess—abdominal incision, staphylococcus subacidis—6 rabbits with no appendix affected.

(f) Pelvic fluid—bacillus Friedlander, bacillus xerosis, staphylococcus albus—one rabbit with appendix involved.

The use of material from the appendix afforded several varieties of organisms and rabbits injected

showed the appendix involved in 40 per cent—16 out of 36.

The use of material from the tonsils of patients with appendicitis showed the appendix involved in 46 per cent—16 out of 35.

4. Material from non-appendix cases: Tonsils and adenoids showed the appendix involved in 30 out of 50 rabbits. A large variety of organisms were isolated.

If appendicitis is a local manifestation of general infection, it should be possible to demonstrate organisms in the blood during the course of the disease. Until this is done, one cannot conclude that particular organisms are at fault.

Production of appendicitis in animals by intravenous injections of large doses of vigorous bacteria cannot be considered an indication that these organisms attack the human appendix in the same way—by blood. The condition produced in a rabbit by these injections is intramural, not the common type of appendicitis. The author finds little evidence to support the belief that human appendicitis is ordinarily caused by blood infection.

MAX KAHN.

Bensaude, R., and Guénaux, G.: Radiodiagnosis of Cancer of the Large Intestine (Le radio-diagnostic du cancer du gros intestin). *Arch. d. mal. de l'app. digest.*, Par., 1917, ix, 109.

The authors' report is based on the study of 28 cases of cancer of the large intestine, the diagnosis of which has been verified at autopsy, at operation, or by rectoscopic examination.

As regards the value of X-rays in the diagnosis of cancer of the large intestine: when a cancerous stenosis and the situation of the neoplasm is clinically determined, radiology plays only a secondary part, yet is of distinct value as confirming the diagnosis and removing uncertainty.

Certain eventualities which arise in practice give the indications for X-ray examination:

1. When there are signs of acute or subacute intestinal occlusion without tumor appreciable to palpation, radiology can localize the cancer.

2. If an abdominal tumor is palpated, this may not involve the large intestine; radiology will show its precise intra- or extra-intestinal situation.

3. Whatever the general state may be, the patient shows functional symptoms of an intestinal affection. It may be a question of a cancer, severe enteritis, intestinal tuberculosis, etc. The radiologic examination will be a valuable aid in the differential diagnosis.

4. Outside of any precise symptoms, the bad general state of the patient may suggest the thought of cancer without any clue permitting its location in a definite part of the organism. An X-ray examination may then discover a latent cancer of the large intestine.

It would be an exaggeration to conclude that radiologic examination is destined to supplant all other exploratory procedures in the large intestine.

In principle radiology will indicate the situation of an intestinal lesion; it can give the characteristic images of a more or less complete stenosis, but it cannot affirm the nature of the lesion because there are no radiologic signs which denote cancer. The signs of stenosis may result from lesions other than cancer. With regard to lacunary images, they indicate simply a limited induration of the intestinal wall, a sign met in ileocaecal tuberculosis, etc. However, there are certain aspects of these lacunæ which are more indicative of cancer; and in an accessory or secondary way it is sometimes possible to affirm that a stenosis is cancerous.

The signs observed through the screen are of themselves of little decisive value in determining a diagnosis of cancer. They take their value in general when added to the clinical findings. Nevertheless radiology is an extremely valuable contribution to the diagnosis of cancer of the large intestine which is not lessened by the difficulties of the technical examination.

W. A. BRENNAN.

Case, J. T.: Adhesions of the Pelvic Colon. J. Mich. St. M. Soc., 1917, xvi, 145.

In Case's opinion the shape and position of the colon deserve little attention, because comparative studies on the identical patient under similar circumstances easily demonstrate the variability of the condition of the colon, but little reliance can be placed upon its location and size as it may appear in a roentgenogram at a given time. He makes a sweeping statement that in a majority of cases the cause of constipation is to be found in the pelvic colon or rectum, although the subjective symptoms may seem to be more pronounced in the proximal colon; doubtless, the constipating lesion is often a complex one and frequently associated with adhesions; such adhesions are not only the cause of constipation but often also the result of it, the situation thus assuming the nature of a vicious circle.

In his anatomical descriptions the author follows "Cunningham's Anatomy" and no longer refers to the sigmoid, rather to the iliac colon as that portion from the crest of the ilium to the inner border of the left psoas muscle and the pelvic colon from the termination of the iliac colon at the inner margin of the left psoas muscle to the front of the body of the third sacral vertebra which forms, when empty, an acute angle with the rectal ampulla. The length of the pelvic colon is variable, the average being 17 inches; it may be as long as 33 inches or as short as 5 inches. Case thinks it very important to note that the pelvic colon normally forms a freely movable loop, its mesentery being longest in the middle of the loop and shortest at the extremities. He describes the mass movement of colonic contents according to Holzknecht, and the large pendulum movement and the small pendulum movement described by Rieder and Schwartz respectively.

The normal defecatory action clears the colon below the splenic flexure and when the colon is

tested by the injection of the opaque enema the patient is able to expel the entire contents of the colon at one effort, except when the pelvic colon is bound down by adhesions or fixed by the pressure of large pelvic tumors. The defecatory act may fail to empty the pelvic loop; in some cases there is absolute inability to expel faecal matter owing to anal fissures, hæmorrhoids, or rectal ulcers or atony of the rectal musculature. Such cases should be classified under rectal constipation. In another class of cases the patient can empty only the rectum below the pelvic junction, owing to a sort of invagination of the too redundant pelvic colon. The author lays great stress upon adhesions at the pelvic-rectal junction, at the middle of the pelvic loop or just below the ileopelvic junction. He declares that the presence of such binding adhesions may be determined by a careful fluoroscopic observation of the colon both before and after normal defecation in connection with the barium enema test. He thinks it may be wiser to speak of the condition as abnormal fixation, admitting that a certain degree of fixation may be normal. Enterospasms very often accompany adhesions of the pelvic colon but they may also be present as an expression of an irritation of another kind. The nodal bundle presiding over this segment of the colon may be the seat of disease or irritation or there may be a chronic colitis or a diverticulosis, or any one of a number of conditions simulating colitis which are attended by this condition as a symptom may be present. He refers to the work of Keith as supporting his contention of a persisting spastic contraction of the pelvic colon which offers an obstruction as serious in its resulting alimentary toxæmia as an organic lesion. Inasmuch as methods of dealing with these adhesions surgically are vexing, Case suggests an operation by which the pelvic loop when fixed is supported in its elevated position by an attachment to the omentum, the latter being sutured to the anterior abdominal wall. This secures for the pelvic colon a swinging attachment which, though not fixing it, holds it out of the bottom of the pelvis. Great emphasis is laid upon the fact that the mere determination of the presence of adhesions is not sufficient indication for operation. There should also be proof that the functional disturbance due to, or associated with, these adhesions, has resisted the non-surgical measures indicated. E. H. SKINNER.

LIVER, PANCREAS, AND SPLEEN

Deve, F.: Multivesicular Hydatid Cysts of the Liver
(Le kyste hydatique multivésiculaire du foie).
Rev. Asoc. méd. argent., 1917, xxvi, 143.

Deve discusses the pathogenesis of hydatid cysts, and gives in tabular form the differential symptomatology, etc., between univesicular and multivesicular cysts.

In treatment he is opposed to the use of the puncture, even exploratory puncture prior to surgical intervention.

The prognosis in univesicular cysts is very favorable, but very grave in the case of multivesicular cysts.

The three cardinal points are:

1. Never to puncture a hydatid cyst, (2) to operate as soon as diagnosed, (3) to endeavor to diagnose as early as possible.

The earlier such cysts are diagnosed the more frequently they will be found to be univesicular and rapid sterilization of the cystic cavity initiated.

W. A. BRENNAN.

Adams, L.: A Case of Amœbic Abscess of the Liver in a Guardsman Recently Returned from the Mexican Border. *Boston, M. & S. J.*, 1917, clxxvi, 808.

The case is reported of a man who had been well since an attack of typhoid 20 years before. After three months' guard duty, he was taken suddenly with sharp abdominal pain, followed in two hours by diarrhœa. Frequent bowel movements, containing blood and mucus, continued until his return north six weeks later.

He continued to be incapacitated by pain in the liver region, this taking the form of a dull ache in the front and back: it was worse at night and occasionally paroxysmal, requiring morphine. There were no more sharp cramps, such as accompanied the diarrhœa; on the contrary, he was slightly constipated, requiring salines occasionally. His appetite was poor and his strength had slowly failed.

Examination showed the patient decidedly ill, eyes sunken and expression anxious; skin and conjunctivæ muddy and emaciation marked. Heart and lungs normal. Liver dullness extended from the fourth interspace in front and the ninth rib behind to 6 cm. below the costal margin in the right mamillary line and 2 cm. below the costal margin in the left mamillary line. There was visible fullness in the liver region and restriction of respiratory movements on this side. There was tenderness at the costal margin in front and behind and moderate muscular rigidity, more marked on the right.

Tenderness also existed over the ascending colon. X-ray showed greatly enlarged liver, especially on the right. White cells, 11,000; red 3,000,000; hæmoglobin 56 per cent; polymorphonuclears relatively increased; eosinophiles not increased. Wassermann negative.

Repeated examination of stools after normal movements and after saline catharsis disclosed no amœbæ. Temperature 99 to 100 for first week, after which there were intermissions. Liver abscess was suspected and a right rectus incision made. The liver edge was found thick and soft, with fluctuation in the right lobe posteriorly; during manipulation the tissue was torn, liberating a liter of thick reddish brown pus which contained large pieces of necrotic liver. The cavity occupied nearly the entire right lobe. Neither bacteria nor amœbæ were obtained from the pus thus set free,

but from the drainage, five days later, were recovered many active amœbæ, containing granules and red blood-cells. The patient was immediately relieved of pain and for a week gained strength but then progressively weakened and died two weeks later with symptoms of bronchopneumonia. There was no evidence of peritonitis. Autopsy was not permitted.

L. R. GOLDSMITH.

Phemister, D. B.: Reconstruction of the Hepatic Duct. *Surg. Clin.*, Chicago, 1917, i, 553.

The patient, a woman, aged 48, was operated upon July 6, 1916, for gall-stones. A somewhat contracted gall-bladder, containing several stones and a small quantity of bile, was found. After freeing the adhesions, cholecystectomy was performed, beginning at the cystic duct. The pedicle of the gall-bladder was cut between two clamps. The distal clamp did not include the cystic artery and a sharp hæmorrhage resulted. After a little difficulty the bleeding point was clamped and ligated. It was noted at the time that considerable tissue was included in the pedicle, but the bile-ducts were not identified in the mass. The gall-bladder was then removed and the wound closed, with a cigarette-drain left in place. There was more reaction following the operation than is usual, and on the second morning the patient was jaundiced. The jaundice increased rapidly until, on the fifth day, it was very marked and the urine was loaded with bile. The bowel movements became light and watery. The patient became somewhat drowsy and continued to vomit occasionally. Pulse 72 to 84; temperature 99 to 100° F. Little drainage was needed and there was no bile from the drainage tube.

At operation, July 11, 1916, the pedicle of gall-bladder was isolated and the ligature cut. After its removal it was found that the hepatic duct had been caught in the forceps with the retracted cystic artery and that a knuckle was included in the ligature. It was difficult to determine the amount of damage to the duct, but, from fear of leakage, it was opened and a catheter introduced. Following the operation all of the bile came through the tube, the jaundice disappeared, and the stools became clay colored. The tube was removed on the twentieth day, but all of the bile continued to come through the wound. Up to the 15th of August no bile had appeared in the stools. The patient felt well and had gained some in weight and strength. It was decided that the ligated portion of the duct had sloughed and that its continuity, therefore, had been interrupted.

At operation, August 16, 1916, for repair of the hepatic duct, extensive adhesions were found. A probe was introduced to the bottom of the fistula and the duodenum and stomach dissected from the under surface of the liver, exposing the duct at the seat of injury. The proximal end of the duct was easily identified by the escaping bile and the end of the distal portion was found by tracing the necrotic

ic bridge which represented all that was left of the constricted portion. A probe was introduced through the duct to the ampulla of Vater. It was decided, if possible, to pass a catheter through the distal portion 6 or 8 inches into the duodenum, then, after turning back a cuff on the other end, to introduce it into the proximal portion, suturing the divided ends of the duct as well as possible about the catheter. It was impossible to pass a catheter through the ampulla into the duodenum despite the fact that it was armed with a silver wire.

The duct was finally repaired with a T-drain, making the two arms that were introduced into the ends of the duct about 1.25 inches long. The divided portions of the duct were so adherent that they could not be brought together about the tube, leaving a bridge of about one-half inch which was covered over by a loop of omentum carefully tamponed about it and held in position by catgut sutures. Bile came freely through the tube to the outside and the first stool on the fourth day was clay colored and gave a negative test for bile. However, the test on the next stool was positive. On the eighth day the outside tube was tied off and all of the bile went into the intestine. The tube was left in position for 84 days, during which time there was never any leakage about it. The patient gained rapidly in strength and weight and became free from symptoms.

November 8, 1916, under gas anæsthesia, the tube was pulled out. There was some leakage of bile for eight or ten hours, when it closed and has remained closed since.

EDWARD L. CORNELL.

Hoerhammer, C.: Extraperitoneal Perforation of the Gall-Bladder. *Muenchen. med. Wchnschr.*, 1916, lxiii, No.41.

Although the majority of gall-bladder ruptures occur within the abdominal cavity, in rare cases the perforation may be external through the abdominal walls. The author has recently observed such a case of extraperitoneal perforation in a woman of 36 years.

In this case a diagnosis of cholecystitis had already been made. On examination, the right side of the abdomen from the costal arch to about two finger-breadths above the inguinal ligament was found to be distended and a tumor the size of an infant's head could be palpated. This was easily movable and was not painful on pressure.

The diagnosis of cholecystitis already made was considered but could not be reconciled with the size and situation of the tumor which was considered to be a retroperitoneal or ovarian cyst.

The woman was operated upon through a pararectal incision. After incision of the posterior sheath of the rectus, there was a gush of yellowish, slightly purulent but non-fetid fluid in which numerous biliary calculi were seen. On enlarging the incision upward and seeking the gall-bladder it was found with its dome adherent to the anterior ab-

dominal wall. The choledochus was empty and permeable. The cystic duct was ligated; the gall-bladder was separated from the liver by the Paquelin cautery; the adherent dome was resected after double ligature; and the stump remaining attached to the abdominal wall sutured into the peritoneum. The patient recovered without incident.

Extraperitoneal perforation of the gall-bladder may occur in one of two ways; either the gall-bladder through inflammatory processes becomes adherent to the neighboring abdominal wall then perforates in this and forming an abscess perforates externally; or the gall-bladder adheres to the peritoneum of the posterior abdominal wall and ultimately developing into a phlegmon perforates externally.

Of those which perforate through the abdominal wall there are two varieties according to the mode of evolution, viz., those that after perforation of the abscess and expulsion of concrements evolve to recovery leaving a permanent biliary fistula, however; and those which do not make a cutaneous perforation but in which an abscess is formed beneath the abdominal wall which may or may not communicate with the gall-bladder. This may become encysted unless a rapidly developed phlegmon is formed. The diagnosis of the origin of such an abscess is not easy except when the contents contain biliary calculi; hence errors of diagnosis are frequently made.

W. A. BRENNAN.

Heyd, C. G.: Association of Pancreatitis and Biliary Affections. *Buffalo M. J.*, 1917, lxxii, 495.

The author offers the following conclusions:

1. Pancreatitis is probably due to both infection and chemical irritation.
2. The very intimate lymphatic connection between the lymphatics of the pancreas and the biliary apparatus is probably a factor in many cases.
3. Gall-stones have a distinct bearing upon the production of pancreatitis, being present in approximately 50 per cent of all cases. The incident of pancreatitis and biliary disease is probably dependent upon the anatomical variations in the terminal portion of the ducts.
4. The passage of a gall-stone with injury and dilatation of the sphincter and ampulla of Vater probably initiates infection from the duodenum.
5. Pancreatic lithiasis probably acts in like manner.
6. By reason of its peculiar anatomy infection once induced in the pancreas is probably not spontaneously cured.

L. H. LANDRY.

MISCELLANEOUS

Wallace, C.: War Surgery of the Abdomen. *Lancet*, Lond., 1917, cxcii, 561.

War surgery is largely concerned with overcoming what in civil life one would call adverse circumstances and in striving to make war conditions as much as possible like those of peace. The con-

ception that war surgery of the abdomen is essentially different from that in civil life developed as a result of the failures, especially in the Spanish-American and South African wars. As a result of these experiences some physicians decided that the expectant treatment was in itself the right procedure. Others believed it was the best that could be done in war. The opposition to operation seems to have been strengthened by the experience gained in succeeding conflicts. In the Russo-Japanese War the results were so bad the Japanese forbade operation in the ambulances. In the light of the experiences of the present war it is obvious that the failures were due essentially to too long delay before operating and in inadequate facilities for postoperative care. The same conditions obtained notably in the early period of retreat in the present war. When the line became fixed it became possible to operate under good conditions. During the early period under expectant treatment the mortality from abdominal injury is estimated at 70 to 80 per cent. Postmortem examinations showed that early deaths were due chiefly to hæmorrhage. Furthermore injury to the gut produced by the supposedly relatively innocuous modern bullet was so extensive that spontaneous recovery in many cases would have been impossible.

These observations together with the good results obtained in a few isolated cases operated upon were largely instrumental in bringing about a radical change in the disposition and treatment of all cases of perforative wounds of the abdomen. After about a year of the war, it became the official routine to transfer with all possible dispatch all abdominal cases to the casualty clearing stations for operation. About 2 per cent of the wounded have been abdominal cases. The mortality varies with the time elapsing since injury. The total mortality during the same battle in one advanced operating hospital that was never pressed with work was 54 per cent, while in another very heavily

worked, many cases arriving late, it was 83 per cent; in one casualty clearing station well forward, 54 per cent; in another farther back, 72 per cent. Under twelve hours after injury, the prognosis generally speaking is fair. After twelve hours the mortality rises rapidly so that by twenty-four hours there is little hope. The limit of successful cases of gut suture has been thirty-six hours. This war has proved that good surgical principles will assert themselves, that the dirty wound must be laid open, and that a penetrating abdominal wound must be explored.

C. A. HEDBLOM.

Tuffier, T.: Arteriovenous Aneurism of Hunter's Canal; Resection of the Vessels; Anastomosis of the Two Ends of the Resected Artery by a Tube of Paraffinated Silver Permitting Arterial Circulation (Aneurisme artérioso-veineux du canal de Hunter; résection des vaisseaux; anastomose des deux bouts de l'artère résequée, par un tube d'argent paraffiné [intubation artérielle] permettant à la circulation artérielle de s'effectuer). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 739.

Tuffier gives the details of an operation which he performed in the case of a patient with an arteriovenous aneurism situated in Hunter's canal at the point of origin of the popliteal, and in which, in order to avoid gangrene of the lower limb after ligature and resection of the vessel, he anastomosed the two arterial ends by a tube of paraffinated silver. Eight days after the tube had been inserted the wound was again opened up and the tube removed.

The operation according to the author appears to demonstrate the possibility of replacing an artery, such as the femoral, by a tube of paraffinated silver for a length of 5 cm. There will perhaps be frequent applications of this method in cases of accidental or surgical arterial rupture, but it remains to be seen how long the tube can remain in place without causing coagulation or accident. In the present case a week elapsed. W. A. BRENNAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Opie, E. L.: Progressive Muscular Ossification (Progressive Ossifying Myositis)—a Progressive Anomaly of Osteogenesis. *J. Med. Research*, 1917, xxxvi, 267.

The author calls attention to the fact that records of a small number of instances of progressive ossification of the muscular system have accumulated during the last century and a half and several medical museums contain skeletons in which massive bands of bone occupying the site of muscles are attached to the vertebræ, ribs, or pelvis and often rigidly unite them to the bones of the arm or thigh.

Other instances of ossification, usually beginning during the first years of life and slowly implicating one muscle or group of muscles after another, have been described. The disease derives peculiar interest from the fact that a large proportion of those affected exhibit an anomaly of the great toes and in some instances of the thumbs. Both great toes are of small size, not extending beyond the first interphalangeal joint of the second toe and often only one phalanx is recognizable.

Opie reports the case of an old man suffering with progressive ossifying myositis which he described because it exhibited the remarkable association of a congenital anomaly of the great toe with abnormal ossification of muscles, aponeuroses, and ligaments. With relatively little muscular ossification

the patient survived until the age of seventy, whereas most of those suffering from the disease have died in childhood or in early adult life.

In this case of Opie's, the pterygoid muscles on the left side had undergone partial ossification, causing ankylosis of the jaw; there was ossification of the interosseous membranes between the tibiae and fibulae, ossification of the ligaments, particularly of the vertebral column, and ossification at the site of attachment of the muscles and fasciae. The bones of the great toe on the right side were imperfectly developed, exhibiting an anomaly which has been found in 70 per cent of those suffering from progressive ossification of muscles. The great toe on the left side appeared to have been amputated, presumably on account of a similar deformity. The bones exhibited other anomalies. Bridges of bone of similar form and even contour united the fifth and sixth and the sixth and seventh ribs on the right side and the fourth and fifth ribs on the left side; there was a persistent frontal suture and the acromian process of the left scapula was not united with the spine. There was throughout the skeleton osteoporosis, which was most advanced in the lower extremities.

The most remarkable character of this progressive ossification of muscles was its association with an unusual anomaly, namely, a retardation of the development of the bones and other parts of the great toes and occasionally of the thumbs. In the case which was described other anomalies of the skeleton were found. There was nothing to suggest that the anomalies associated with progressive ossification of muscles were referable to an inflammatory disease of fetal life, and histological study of the changes found in the affected muscles did not indicate the presence of myositis. The normal course of osteogenesis had undergone a disturbance which had had its origin in embryonic life. This perversion of the cells concerned in osteogenesis persisted and manifested itself by progressive new formation of bone throughout life in situations in which bone is not normally formed.

GEORGE E. BEILBY.

O'Ferrall, J. T.: Multiple Cartilaginous Exostoses.
N. Orl. M. & S. J., 1917, lxi, 808.

The author reports two cases which came under his observation. One, a boy aged 8, developed an exostosis in the upper tibial epiphysis on the inner side, following an injury. The second case was a girl, aged 10, who had lues with coincident congenital exostoses easily palpable at the lower third of the femur on both sides, in the right popliteal space, upper third of the left tibia, lower third of the left radius, and upper third of the right humerus. Diagnosis of specific synovitis with coincident congenital exostoses was made. The girl's eyes showed a markedly injected conjunctiva and photophobia. A specific iritis existed. A well-defined set of Hutchinson's teeth was also present.

Attention is called to the fact that multiple

cartilaginous exostoses are not so rare as formerly believed, there now being some 600 cases recorded and about 350 articles on the subject. The author believes that surgery is not indicated unless there are acute local symptoms referable to a particular exostosis. Exostoses were found in less than five per cent showing secondary malignant changes.

H. W. MEYERDING.

Simmons, C. C.: The Treatment of Osteomyelitis.
Boston M. & S. J., 1917, clxxvi, 653.

The author's report is based on 22 consecutive cases of osteomyelitis of less than one year's duration, with the results of treatment one year from the date of operation. He makes a plea for the recognition and prompt energetic treatment of acute osteomyelitis and speaks of the frequency with which the disease is overlooked in the mild cases.

As regards prognosis, he divides the disease, roughly, into two classes: cases of over one year and less than one year's duration at the time the patient is first seen, the point being that after one year the bone loses to a great extent its power to regenerate.

He believes that cases seen less than one year from the date of onset should be cured by operation, although there are many exceptions to this rule. One operation is rarely sufficient for a cure but at the first operation some plan can be made for further interference.

Osteomyelitis is either diffuse or local, that is either the entire shaft of a long bone may be destroyed, or only a portion. The local form is the more common. It may be very mild and in certain cases the author believes the infecting organism may be so attenuated that the process will heal spontaneously. The amount of bone destruction depends on the virulence of the infecting organism, the resistance of the individual, and the portion of the bone involved. If the organism is of low virulence the process may become local and quiet down without operation forming a chronic bone abscess. Later, often following trauma or a general infection, they may become active again and are often diagnosed as rheumatism.

The X-ray is of no value in the acute cases but is essential in the later stages as a guide to treatment. The bacterium is a blood-borne organism and in this series the staphylococcus was more virulent than the streptococcus.

There were three cases in which the diagnosis of mild acute osteomyelitis was erroneously made, two of which were operated upon. The author would not hesitate to operate in cases with a similar history at any time, for the reason that if an error is made the wounds heal promptly and no harm is done, while if the diagnosis is correct a great deal of damage to bone may be prevented by an early operation.

There were fourteen cases seen in the acute stage, and eight in the subacute. Four were cases in which several bones were involved and there were two cases of subacute bone abscess. There were two deaths.

Subperiosteal resection was performed six times

with prompt regeneration in each case and good functional results in all the cases. In two of these cases all of the shaft of a long bone was resected, and in four a portion only.

A classification of the disease is given based chiefly on the treatment to be instituted in the different types of cases.

The author sees no reason to change the conclusions drawn in a previous paper published in *SURGERY, GYNECOLOGY AND OBSTETRICS*, February, 1915. Acute osteomyelitis varies greatly in severity from a mild local infection of a single bone to an overwhelming septicæmia with involvement of several bones and often death. The milder forms are more common. Cases seen a short time from the date of onset should be cured by operation although two or more operations are usually necessary.

The disease in the ilium or femur is difficult to treat and the hope of ultimate cure less than when bones of the forearm or lower leg are involved. The multiple type is very difficult to handle. The cases should be very carefully followed during the first year.

Bousquet: Shell Fragment Free in Right Knee Articulation for Five Months; No Trace of Infection; Extraction and Rapid Recovery (Eclat d'obus libre dans l'articulation du genou droit depuis cinq mois; aucun trace d'infection; extraction du corps étranger guérison rapide). *Progrès méd.*, 1917, p. 14.

Bousquet reports the case of a man wounded in April, 1916. Of two shell fragments which entered the thigh only one was extracted. The man was

obliged to re-enter the hospital seven months later and radiographic examination showed a piece of shell free, probably in the knee-joint. The lower, internal cul-de-sac was opened and the foreign body extracted. The observation shows that it should not be accepted as an axiom that all shell fragments are fatally septic when such a fragment can enter a knee-joint and still cause no infection.

W. A. BRENNAN.

Putti, V.: Surgical Mobilization of Ankyloses of the Knee (La mobillizzazione chirurgica delle anchilosi del ginocchio). *Chir. d. organi di movimento*, Bologna, 1917, i, 1.

The author reviews the surgical methods of treating ankylosis of the knee. In 1913 he reported 3 cases in which fascia lata strips were interposed in the surgical mobilization of the ankylosed joint. He now gives detailed particulars of 6 additional cases.

The procedure followed may be summarized thus: extended Kocher incision prolonged so as to completely surround the tibial protuberance; detachment of the tibial protuberance; detachment of patella; destruction with large scalpel of osseous adhesions of the internal condyles and detachment of the fibrous adhesions of the external condyles; complete opening of the articulation and luxation of the two articular extremities; resection of a bone-plate from the femoral epiphysis about 1 cm. thick; similarly for the tibia; removal of peri-articular tissue; prolongation of the cutaneous incision upward; removal of a strip of fascia lata which is transplanted covering the section surfaces; reconstitution of the articulation; fixation of the

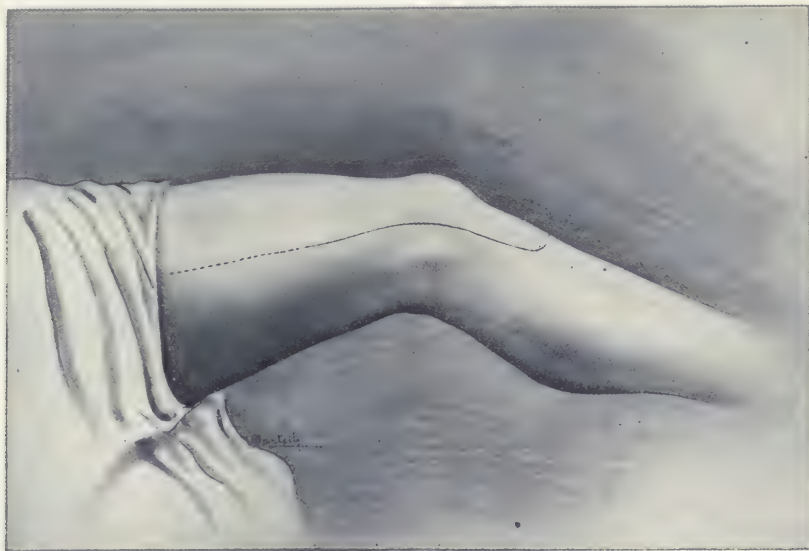


Fig. 1. Kocher incisions. The dotted line follows the prolongation of the incision necessary for the mobilization of the transplant of fascia lata.

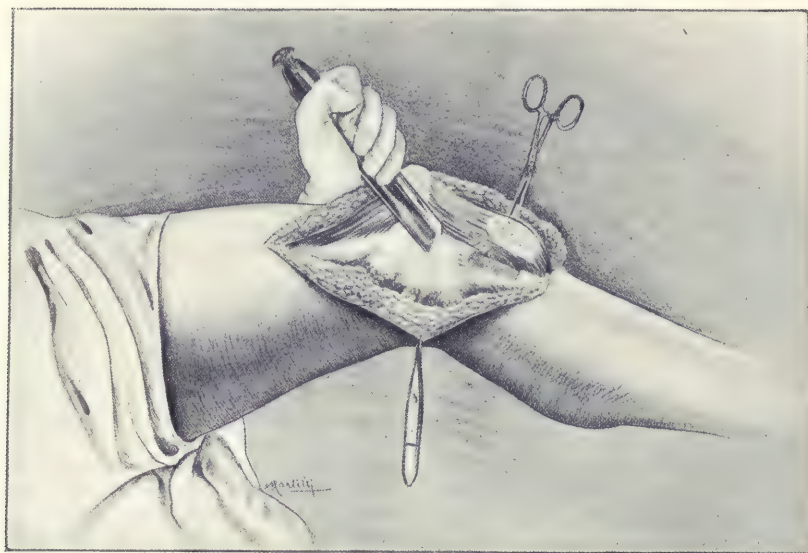


Fig. 2. Detachment of the tibial and arthrolized protuberance.

patellar protuberance to the tibia with two long metallic nails; Z-tenotomy lengthening the quadriceps tendon; suture in layers; aseptic dressings; plaster immobilization in semiflexion with longitudinal traction.

Several of the steps are shown in the accompanying illustrations. The one above shows the tibial and arthrolized protuberance.

Of the author's 9 cases 7 have been successful. The results in 4 of these cases are excellent — 100° , 95° , 85° , 80° ; 1 good — 125° of movement but articular instability; 2 medium — 50° , 40° . The period of observation ranges from eight months to four years, averaging more than two years.

In classifying the results into excellent, good, and medium, the author takes into account not only the amplitude of movement, but all the other elements which establish a greater or less similarity of the neo-arthritis to a normal articulation. That such reconstituted joints have more than a purely esthetic value may be affirmed from the fact that at two, three, or four years after mobilization the neo-arthritis permits the patients the secure painless use of the limb, exercise of their occupations, and easy walking, with scarcely appreciable claudication. But although the functional adaptation of the neo-arthritis is manifested by the unconditional use of the limb; the new formations can never be considered as normal articulations, as the anatomical alterations can neither be compensated nor eliminated. What can be said is that by surgical mobilization with interposition of transplants it is today possible to create neo-arthroses of the knee which possess mechanical, statical, and cinetic qualities to a high degree and which fully satisfy the patient.

W. A. BRENNAN.

Quénu, E.: Study of Wounds of the Foot (*Étude sur les plaies du pied*). *Rev. de chir.*, 1917, ii, 541.

Quénu gives details, illustrations, and statistics of a large number of simple and complicated war injuries of the foot comprising:

1. *Wounds of the anterior part.* Of these there were 79: 45 metatarsal, 34 anterior tarsal. No deaths occurred.

There were 13 partial mutilating operations: 3 Pirogoff operations, 1 Syme operation, 3 Chopart

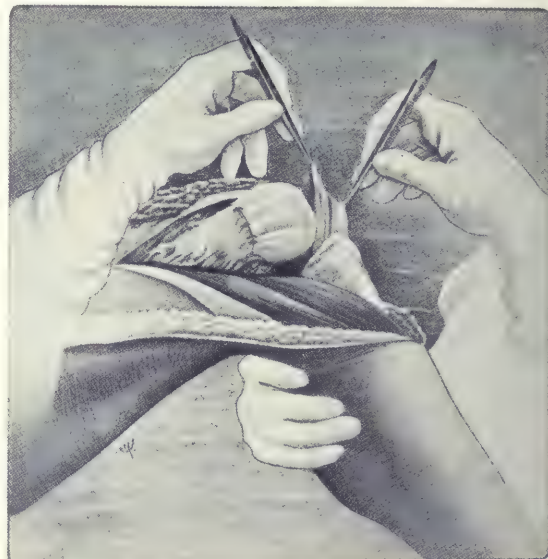


Fig. 3. Adaption of the strip to the resected epiphysis.

operations, 5 Lisfranc operations, 1 Ricard operation.

There were 25 non-mutilating operations: 7 toe amputations, 16 metatarsal resections, 2 tarsal resections.

2. *Wounds of the posterior part.* Of these there were 37:1 with total crushing; 6 with extra-tibio-articular astragalus lesions; 30 with calcaneum lesions.

Two limb amputations were necessary. There were 5 partial amputations, all in the calcaneum lesions. The 6 extra-articular astragalus fractures had a simple evolution.

3. *Wounds of the instep.* There were 49 of these: 7 wounds of soft parts, 5 crushing injuries, 13 mortise fractures, 11 astragalus fractures (6 incomplete), 7 astragalus mortise fractures, 6 astragalus — calcaneum fractures.

The 5 crushing injuries necessitated primary amputation. Of the other 44 cases, 39 recovered without mutilation; 5 with some mutilation — 2 total, 3 partial.

Under normal conditions of treatment the only really grave wounds of the instep are those complicated by fracture of the calcaneum.

Quénu points out that the cases referred to in his report are those evacuated to the interior hospitals and are therefore selected cases. Many injuries of the foot are amputated at the front or succumb as the result of gangrene or other complication. Such cases are not included in his statistics.

W. A. BRENNAN.

Delitala, F.: The Normal and Pathologic Anatomy of the Skeleton of the Foot with Especial Reference to Traumatic Lesions (Sull' anatomia normale e patologica dello Scheletro del piede con particolare riguardo alle lesioni traumatiche). *Chir. d. organi di movimento*, Bologna, 1917, i, 95.

Delitala's studies on the normal structure of the foot and of pathological alterations in it were made during a period of 15 years in the Rizzoli Orthopedic Institute, Bologna. The report is based on cadaver experiments and clinical materials and the results.

The questions which Delitala investigated were as follows:

1. What projections are best adapted to the study of the pedal skeleton?
2. What are normal relations between separate bone, especially the astragalus and calcaneum?
3. What is the form, number, and frequency of the ossæ tarsalæ?
4. What are the radiographic criteria necessary for a differential diagnosis between morbid processes which result in atrophy or osseous destruction and neoplasms?
5. What evidence can radiography furnish for the diagnosis of recent and old fractures and more particularly for osseous war lesions?

Typical projections suffice for the production of images of the foot in which the topographical relations are constant. The two necessary projections

are the dorsoplantar (the aperture of the compressor tube is parallel to the axis of the foot skeleton) and the external lateral (the external margin of the foot rests against the support); the sole of the foot and compressor tube should be exactly perpendicular to the support. On the normal radiographs obtained in this way Delitala has been able constantly to fix points of pseudo-atrophy which should be well known in order to avoid confusion with true destructive foci.

Supernumerary or tarsal bones have special characters which are of value in differentiating them from fractures of the astragalus and scaphoid; but in some cases the differential diagnosis between the os trigonum and a detached posterior process of the astragalus becomes impossible. Radiographs showing typical os trigonum and os peroneum are given.

Tuberculosis, whether synovial or osseous, gives rise to total atrophy of the foot, but with limited destructive foci. The selective locations are the calcaneum and astragalus. By radiography we can experimentally demonstrate the existence of destructive foci of the dimensions of a pea in the central parts of the spongiosa.

Differential characteristics exist between neoplastic forms, osteomyelitis and tuberculous forms. Tubercular lesions of the scaphoid can be differentiated from those produced by Koehler's disease.

Tarsal fractures can be classified according to rational radiographic criteria; some types of fracture are easily diagnosed, others (longitudinal fractures of the astragalus and of calcaneum; incompletely consolidated fractures) can only be approximately diagnosed. A pathognomonic character of fractures of the calcaneum is furnished by the presence of particular shadows which are observable overlying the normal trabeculation of the calcaneum; these are due to wedging of the cortical of the superior table in the midst of the spongiosa and to the exuberant formation of callus.

In war lesions radiographic examination can be of important service, both as regards localization of foreign bodies and for the diagnosis of fracture; also to establish the situation and extent of osteomyelitic foci. In such cases as well as in rigidity and normal or deformed ankyloses of the foot, it can serve as a guide to prognosis and treatment.

W. A. BRENNAN.

Chalier, A.: Severe Wounds of the Foot (Les grandes blessures du pied). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1029.

Chalier treated 30 ambulance cases of severe foot injuries; one of the soft parts only and 29 osteo-articular injuries. Three of these cases were total foot injuries and necessitated amputation of the unit in two cases.

Of the total 30 cases involving the foot or instep 3 died, 1 from tetanus and 2 from gangrene; in 10 cases the whole limb was amputated and in 4 cases there were partial amputations; 13 cases recovered

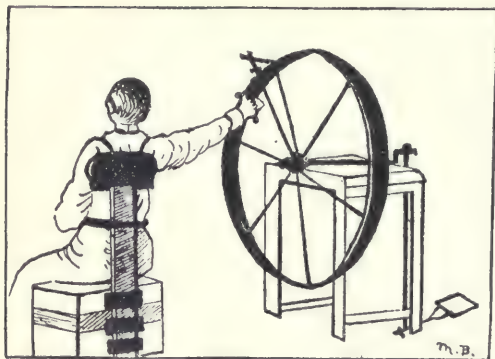


Fig. 1. Apparatus for treating stiff shoulder-joints. (Johnson-Smyth.)

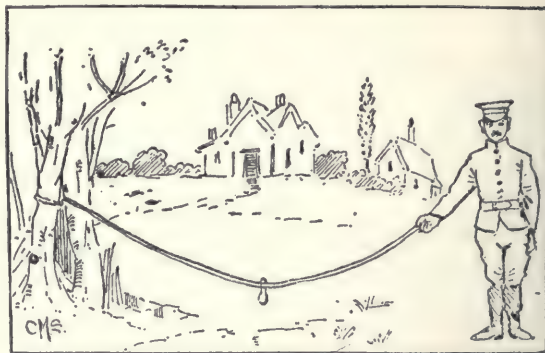


Fig. 2. Second stage of treatment for stiff shoulder-joints. (Johnson-Smyth.)

without mutilation. The metatarsal injuries were the most benign. In these cases there was only one death due to gangrene. In posterior part injuries there was one amputation for septicæmia. Instep injuries show 1 death and 5 amputations and those complicated by calcaneum lesions have been very grave. As a general rule Chalker was not able to operate upon these patients until after infection had set in.

The essential element in the successful surgery of injuries of the foot is early intervention.

W. A. BRENNAN.

McClure, C. R.: Paralytic Deformities of the Feet.
Northwest Med., 1917, xvi, 33.

The usual foot deformities following infantile paralysis are described and the various methods now in vogue in treatment of these cases are well illustrated in the author's article. Operations are not advocated until at least two years after the initial attack, and during this period the author believes that the internist, neurologist, and mechanotherapist should be given a free hand to assist nature in the restoration of paralyzed muscles. Illustrations of all the various operations, such as astragalectomy, arthrodesis, tenodesis, tendon-transference, silk ligaments are given. McClure emphasizes the importance of careful after-treatment, especial attention being given to mechanical features. He believes there are many patients now wearing supports and braces who can be materially benefited by slight operations.

C. C. CHATTERTON.

Johnson-Smyth, W.: A New Method for the Treatment of Immobile or Stiff Shoulder-Joints.
Practitioner., Lond., 1917, xcvi, 575.

Immobility or stiffness of the shoulder is becoming more common since the war began. The author describes a method which he has found satisfactory in the treatment of such cases. It should not be used, however, when the immobility is associated with tuberculous or adjacent arterial trouble. After

the treatment has been well established by nurse or surgeon it can be carried on by the patient at his own home. The apparatus first used (Fig. 1) consists of a wheel, four feet in diameter, attached to a table, the movement to be produced by hand, pedal, or otherwise. With the patient strapped to a chair the shoulders are manipulated with the apparatus, the speed and circle of circumduction being gradually increased, 60 revolutions being a desirable rate. In two weeks, with treatment twice a day, the patient is usually ready for the second stage of the treatment, which is carried out by means of a skipping rope (Fig. 2), 14 inches in length, fastened to a tree or wall at a level with the patient's shoulder. A small weight is attached to the center of the rope, and the patient with his scapula fixed by a belt around the shoulder and chest, swings the rope. Progress is certain when the patient once becomes accustomed to this exercise.

C. C. CHATTERTON.

Bashford, E. F.: General Pathology of Acute Bacillary Gangrene Arising in Gunshot Injuries of Muscle. *Brit. J. Surg.*, 1917, iv, 562.

The histological appearances of a portion of the excised segmental muscle comprise three segments: (1) injured, (2) reacting, (3) normal.

In the injured segment, staining of smears by Gram, Saathof, or methylene-blue, showed the presence of a most extraordinary number and variety of organisms. In keeping with the surgeon's opinion on the condition of the wound, there are present organisms resembling the bacillus perfringens and also the bacillus œdematis maligni; but they may be Hibler's bacillus or any of many others. As a matter of fact, it would be difficult to record the surprisingly large number of long, short, fine, curved, thick and thin bacilli, large and small cocci, or bacteria with terminal spores, subterminal spores or medial spores. The attempt to maintain this diversity in culture for experimental purposes failed. What is important to record is that in secretions this great variety is at its maximum

among the dead muscle fibers, not in them, and most of the fibers have persisted without extensive bacterial invasion, or without being invaded at all. Here and there a colony of one type of bacillus is met with, or a muscle fiber — usually greatly disintegrated — bristles with bacteria, but these are exceptional. The bacilli are not essentially "muscle feeders," as the phrase goes, but live in the lymph spaces which represent the endomysium and in the "beef emulsion." The variety is less in the clot, with its multitude of leucocytes. Cocci and a small bacillus preponderate near the injured septum, and here also many organisms are observed inside leucocytes, whereas they are not so included in the area of massive mixed infection or maximal bacillary growth. No organisms at all are observed beyond the first injured septum, but the histological method of itself becomes unreliable at this point.

A segmental muscle gives in brief compass a picture of what takes place in long muscles, but in the former there is a more marked delimitation of the several processes. In a long muscle, the various stages of tissue injury and bacterial invasion may pass rapidly from one to another throughout a great length of tissue; the bacterial invasion, acquiring increased magnitude with every step, comes to involve not only single muscles, but groups and even the entire limb.

In an injury to a long muscle, the portion distal to the wound must be considered separately from the proximal portion which still retains its blood supply. In the former nearest the injury there is a zone of dead fibers — dark-staining fibers — embedded in clot which is disorganized by a varied and prolific bacterial growth.

The muscle sheath shows hæmorrhage and leucocytic infiltration, also dilatation of its vessels, and the capillaries are engorged with blood, some of them containing polymorphonuclear leucocytes, with which also the fibrous tissue is densely infiltrated. This leucocyte infiltration is most marked only where the micro-organisms are in variety. The margin of this leucocyte infiltration corresponds with the point where the endomysial spaces between the muscle fibers become crowded with long bacilli. Only here and there is there any penetration of these bacilli into the zone of leucocytic infiltration. The leucocytes at the margin are actively phagocytic of the long bacilli.

Here and there, both between muscle fibers and bundles, as well as beneath the sheath, and in the sheath itself near the wound, but not near the insertion, there are numerous large bubbles visible to the naked eye, and the microscope reveals other smaller ones. In the muscle they are invariably between bundles of fibers, never in them; the manner of the arrangement of leucocytes and bacteria round the margin of a bubble is always the same — they have been pushed aside during life, as have also the muscle fibers, which, however, nowhere show signs of having been subject to pressure, signs

of which are also absent in the exudate and the capillaries between the neighboring fibers.

Beyond the injured area there is a pure culture of long bacilli up to the insertion of the muscle; they extend in the lymphatic spaces.

The histological picture presented by the portion of a muscle still receiving its blood-supply when it is invaded by bacilli, is very much more complicated than in the case of the distal portion. On the whole, the absence or scarcity of leucocytosis contrasts strikingly with its domination over every other feature when the micro-organisms are the pus-forming cocci, either in pure culture or mixed with anaerobic bacilli. The absence of leucocytosis is also a striking feature at the advancing margin of bacillary invasion and in the œdema. The leucocytes may not set up an effective protective barrier against the invasion of healthy tissue by massive doses of these bacilli. Not an inflammatory leucocytosis, but an inflammatory leucopœnia is characteristic of the pure bacillary invasion of muscle, and this must be borne in mind in judging of the apparent efficacy of any method of treatment which relies on the abundant formation of pus as a sign that all is going well, or aims even at maintaining a pus poultice for days on end without interference.

The muscle fibrils in some places exhibit striation, in others they appear swollen and homogeneous, and there are irregularities in the numbers of sarcolemma nuclei from one area to another. The muscle bundles and fibers are unusually closely packed together in some areas and visibly separated in others. The connective-tissue fibers are swollen as in œdema.

The first of the sequence of events in the circulatory disturbance appears to be accumulation of fluid in the endomysial spaces. At a later stage capillaries and even veins rupture. Although lymphatics are not known to occur even in the large divisions of the endomysium of voluntary muscles, it is common to see engorged or ruptured vessels which either are lymphatics or are very distended capillaries filled with altered, granular blood debris looking like the normal contents of lymphatics. Disintegrated capillaries and veins are common and embedded either in recent hæmorrhage or in altered homogeneous blood. Veins showing a fibrin thrombosis, and even adhesions of red blood corpuscles to degenerated endothelium, are easily found. Extension by way of the connective tissue surrounding veins appears to be common and to explain the advance of infection, e.g., from the leg to the thigh. This is not an extension by muscles.

There is histological evidence that the products of the bacilli damage the vessels and the muscle fibers and the endomysium ahead of their massive advance, and less evidence that the lymphatics are similarly involved. The process of bacillary invasion is further assisted by the motility of some of them in the fluid poured out into, but not absorbed from, the tissues and by the disorganization of the vascular arrangements.

A marked contrast exists between the healing of muscle under aseptic conditions and the interference with healing, or perhaps diversion of the normal process into other channels, which occurs in muscles remote from the actual presence of organisms. The observation that bacterial products have this action on other cells lends weight to the surmise that these products are responsible for a modification in the endothelial cells of vessels which leads to the adherence of blood-plates and fibrin to their walls, thus aiding in initiating thrombosis. The action of the bacterial products is not disseminated throughout the body, but, like the corresponding vascular condition, it is restricted to the infected areas and the muscle fibers in the immediate neighborhood. Interference with muscle regeneration may be proceeding under a layer of granulation tissue, which, from its not being strikingly unhealthy, or only backward in places, is regarded with little suspicion and left alone, or the refractory areas are treated in various ways in the hope that they will improve. In such cases, where it probably overlies not only microscopical fragments of khaki, but where there is also likely to be coccal or bacillary invasion of its deeper layers or of the underlying muscle, it would be better to strip off the granulation tissue. Perhaps in many other cases also the time occupied in attending to the granulations would be better occupied by removing them and, when suitable, obtaining secondary union by means of the pure tissue reaction which is found in the healthy regeneration of muscle by approximating the surface of wounds.

Thrombosis has come into even greater prominence as a most important factor in promoting the extensive and rapid spread of bacillary invasion. In the course of these investigations, thrombosis has been met with in vessels, usually veins, on the proximal side of the wound and, once attention was aroused, it has been found a quite common occurrence, not only in larger vessels, but more especially in those of small and even capillary diameter. The great frequency of secondary hæmorrhage or of the sloughing of amputation stumps is probably not limited to the author's observations, and may find a partial explanation in the presence of undetected thrombosis.

A review of all the facts brings out the following salient features when the immediate injury to muscle and vessels and the actual implantation of organisms in these tissues is left out of account. All the vessels in the neighborhood of an infected wound are exposed to the products arising from the growth of the bacteria and tissue destruction. At the advancing margin the bacilli have not been found invading the large vessels or even the capillaries, but they speedily do so when the latter are bathed in a pure growth, such as obtains in the interfibrillary spaces of muscle which are dying and purple in color, or dead and like smoked salmon. Hæmorrhage from capillaries and even large vessels, especially veins, is common, and the

walls of small vessels, i.e., the site of election for diapedesis, have been found infiltrated by leucocytes. Nevertheless, a leucocytosis is not an accompaniment of the bacterial invasion and this infiltration may be merely a response to damage of the walls. There is evidence of damage to the endothelium of vessels and capillaries, not only in areas where the circulation has been disturbed by the immediate wounding of large trunk vessels; this damage may with reason be ascribed to the action of the products of bacterial growth. It must also be recalled that the blood circulation has already been impaired by vasomotor disturbance, weakened heart, impaired nutrition of the vascular endothelium and a febrile condition, all leading to a slowing of the blood stream, especially in the veins. There is evidence of blood destruction by hæmolysis, just as there is of other tissue destruction by the bacterial products. This blood and tissue destruction will of itself predispose to thrombosis by the presence of débris, altered viscosity, and by increased coagulability of the blood elements; the disposition which has been described of blood-platelets, fibrin, and leucocytes on an altered vascular endothelium will be thereby promoted, leaving out of consideration the possibility of the actual plugging of minute vessels by débris or agglutinated red blood corpuscles. The withdrawal of fluid from the blood in the extensive oedema indicates the altered nature both of the blood and the vessel walls. Notwithstanding all these considerations which point to alterations in the blood, the circumscribed localization of thrombosis emphasizes the prime importance of the purely local causes, i.e., damage to vascular endothelium. Therefore, in the production of thrombosis, while there appear to be many contributory causes, the local causes are those which determine the site at which it will occur and these are directly traceable to the effects of bacterial invasion of the tissues in the neighborhood of vessels.

The chief importance of thrombosis lies in the provision of fresh areas of dead tissues suitable for the extension of bacterial invasion, and in the essential stage it provides an ever-widening and vicious circle.

The clinical facts familiar to all workers, together with histological studies and certain bacteriological observations on the experimental production of thrombosis and gangrene, make it clear that the bacilli in question are pathogenic when in combination with one another. Whatever qualification is applied to their pathogenicity, or implied by enhancing the significance of the circumstances under which they invade the body, the fact remains that they produce the most terrible surgical problems of this war, and perhaps take toll of most of the deaths from wounds which are not immediately fatal. They get away easily into the muscular tissue from the cesspool of the wound and flourish exceedingly without the companionship of cocci or other pus-forming organisms. In a

human thigh to which they have gained access directly or after passing the zone of mixed infection and leucocytic infiltration, they grow as luxuriantly as when inserted by a hypodermic needle into the thigh of a rabbit, a guinea pig, or a mouse, and with equally fatal results.

The combinations in which anaerobic bacilli occur in gunshot injuries are exceedingly virulent. While the bacilli themselves multiply mainly in the areolar tissue of the endomysium, their products actively destroy the endothelium of vessels, muscle fibers, and blood. Destruction of capillaries, veins, and lymphatics is the outstanding feature of the rapid spread of the infection, which is also accompanied by swelling and degeneration of muscle fibers and later by the formation of gas. Constitutional symptoms arising from interference with the cardiovascular and heat-regulating mechanism ultimately supervene and usher in the end.

The production of gas is a late and, really, a subsidiary phenomenon which attracts attention from its mere peculiarity. It plays no part in the advance of infection, although it contributes to the later swollen condition. It arises in tissue long dead; for this reason the term "gas gangrene" is unfortunate, owing to its implying the necessity of awaiting the detection of gas before making a diagnosis. In its place the author suggests either the term "acute bacillary gangrene" or "war gangrene." The restriction of the most serious forms of infection to long muscles is explained by the vascular arrangements and the large masses of tissue which become suddenly involved.

EDWARD L. CORNELL.

FRACTURES AND DISLOCATIONS

Brown, A. J.: Treatment of Colles' Fractures Considered from the Standpoint of Muscle Physiology. *Am. J. Surg.*, 1917, xxxi, 122.

The author presents an excellent article on the treatment of Colles' fracture from the standpoint of muscle physiology. Careful perusal is necessary to get the gist of the paper.

The technique of reduction and immobilization is as follows: The patient is anesthetized to the primary stage, nitrous oxide gas being used in most cases and impaction, if present, is completely broken up. This is accomplished in the following manner: The hand of the operator which corresponds to that of the injured wrist, grasps the hand. The hand and wrist are then hyperextended as far as possible, thus loosening the anterior portion of the fragments and increasing deformity. The operator's other hand grasps the forearm at its lower portion just above the line of fracture. Traction and countertraction are applied, the hand of the patient being drawn into a position of marked ulnar abduction and at the same time the upper hand of the operator supinates the upper portion of the forearm while the lower hand slightly pronates the lower fragment, thus bringing them into as

perfect alignment as possible. It may be necessary at times to assist the pronation of the lower fragment by pressure with the thumb upon the lower extremity of the radius. The above manipulation is carried out two or three times.

The brachioradialis exerts a slight action of pronation upon the lower fragment, and it is well to assist this action by slight pronation of the lower fragment on the upper, but it is essential that the upper forearm should remain in complete supination.

The conclusions are as follows:

1. The present methods of treatment of Colles' fracture leave something to be desired, as many of the results obtained in the hands of competent surgeons are unsatisfactory from both a functional and a cosmetic standpoint, and in some cases convalescence is unduly prolonged.

2. It would appear from a study of the surface form of the fragments and the action of the muscles upon them that there is a tendency toward recurrence of the deformity even after complete reduction of the fracture.

3. This tendency can best be overcome by placing the forearm in such a position as to lessen the strength of the pull of the muscles which reproduce the deformity and at the same time furnish an antagonistic muscle, and thus restore muscle equilibrium.

4. The position of the forearm, which fulfills the above indications, is that of complete supination, and therefore this would appear to be the logical position in which the forearm should be immobilized.

5. It is important to remember that supination of the forearm can be maintained only if the elbow is immobilized in addition to the wrist, and this can be accomplished by extending the splints above the elbow.

6. In the hands of the author the above method used as a routine has afforded better results with less protracted convalescence than any other method heretofore employed.

H. W. MEYERDING.

Martin, E.: Treatment of Fracture of the Long Bones from the Viewpoint of Function. *Penn. M. J.*, 1917, xx, 658.

The author believes that every fracture is an emergency case, and the earlier reduction is carried out the better are the end-results obtained. He favors the use of an anesthetic in reduction of fracture and his ideal is firm union without deformity. This ideal is difficult to obtain, except in the young. Traction to overcome muscle spasm is all important. He accomplishes this through adhesive-extension or use of the Steinman pin.

Radiographic and fluoroscopic examinations should be frequent. In compound fractures the Carrel method is advocated, careful position, traction, and splinting receive due attention. After-treatment, massage and motion he believes, are indicated early. Fracture cases should be observed months after union.

C. C. CHATTERTON.

Chiossone, F.: Disarticulation of the Shoulder Under Local Anæsthesia and Section of the Brachial Plexus (Desarticulation del hombro con anestesia local y seccion del plexo braquial). *Prensa méd. argent.*, 1917, iii, 360.

In a patient whose condition did not admit of general anæsthesia, Chiossone carried out a shoulder disarticulation with section of the brachial plexus under regional anæsthesia. The procedure was as follows:

1. Local anæsthesia was administered in the cervical plexus region, especially along the posterior edge of the sternocleidomastoid muscle, special treatment being given to the two descending branches of the plexus, the supra-acromial, and the supraclavicular; infiltration of the site of incision.

2. Incision for disclosure of the plexus a little high, for the ligature of the subclavian artery.

3. Uncovering of the first branch of the plexus and injection of ethyl chloride along the branch as far as the point selected for section. Section of the branch by the bistoury was then quite painless and without any mechanical physiological excitation in the territory of distribution.

4. The other branches of the plexus were taken up, anæsthetized, and sectioned in the same manner with the same results.

5. After section the points of anastomosis of the terminal branches on the thoracic wall and other involved parts were infiltrated and the disarticulation of the shoulder proceeded with according to the usual technique. The patient was entirely devoid of feeling.

6. The quantity of anæsthetic employed has been 30 grams of ethyl chloride and 15 ccm. of codrenin solution — one part codrenin to two parts physiologic solution.

Cicatrization has followed normally. After six days sutures were drawn, a drain being maintained.

W. A. BRENNAN.

Rich, E. A.: The Check Ligament Operation for Recurrent Dislocations of the Shoulder. *Northwest. Med.*, 1917, xvi, 114.

The author believes the shoulder does not dislocate when the arm is at rest beside the body, and that misplacements occur when abduction extension is carried above the 90 degree arc. When an accident occurs of sufficient severity to rupture the shoulder-joint capsule and cause a dislocation it is also likely to injure the tendons of the overstretched muscles. The most common occurrences are a rupture of the supraspinatus subscapularis and teres major. There seems to be a disposition for epileptics to be subject to recurrent shoulder dislocations.

He advocates the insertion of a double band of silk ligaments between the scapula and the humerus to restore the unity of action of the shoulder girdle, a procedure first recommended by Galloway of Winnipeg. The technique is as follows: Three inches below the upper end of the humerus, on the posterior and inner surface, two holes, half an inch apart, on

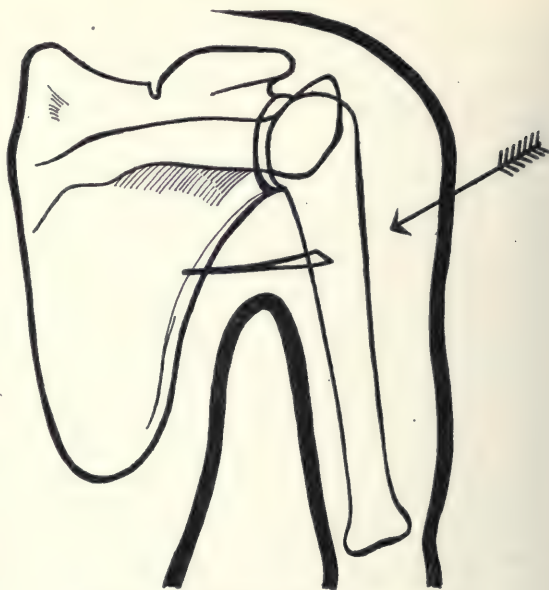


Diagram of scapulohumeral check ligament.

the same plane are drilled through compact bone. With a sharply curved ligature carrier a strand of very heavy No. 18 Lange silk, prepared in paraffin and bichloride, is drawn into one aperture and out the other. The outer rim of the scapula is exposed at a site about three inches below the spine of that bone, and a hole drilled through the flat surface just within the rim. The muscular structures between the two incisions are penetrated with a straight ligature carrier; both ends of the silk that have been threaded into the humerus are drawn through the intervening muscles to the rim of the scapula.

The arm is abducted to a position about 60 degrees with the body and, after one strand has been passed through the drilled hole in the scapula, the silk is tied. The silk acts as a check ligament until the engrafting of the periosteum about it is accomplished.

Rich states that none of his patients has had a recurrence. Later they swim and indulge in games with the exception of hand ball, volley, and wrestling. He recommends the operation very highly.

PHILIP LEWIN.

Roello, G.: Contribution to the Study of Traumatic Luxation of the Hip in Infancy (Contributo allo studio della lussazione traumatica dell'anca nell'infanzia). *Clin. chir.*, Milano, 1916, xxiv, 1480.

Roello shows that traumatic luxation of the hip in early childhood is very rare. He has been able to find only 35 cases in the literature. He gives the clinical details of a case observed by him in a little girl of 5 years old in which the objective and radio-

logic examinations disclosed traumatic posterior luxation of the right hip of the ischiatic variety. The case was treated by fixation in plaster bandage, slight abduction, and slight external rotation with excellent results.

From his study of this case and those reported in the literature Roello draws these conclusions:

1. Traumatic luxation of the hip is a rare lesion during infancy and the early years and is proportionately more frequent in later years. It is more frequent in the male sex.

2. The rarity of the luxation is not explicable by the greater frequency of femoral fracture, since this includes only diaphysary fractures which generally have a pathogenesis different from luxations; it is rather in strict relation with the anatomophysiologic peculiarity of the articulation.

3. Iliac luxations are the most frequent variety. Irregular luxations have not been found. Bone complications are very rare.

4. The symptoms are not characteristically different from those of the adult. The period of reduction is shorter than in the adult owing to the more active proliferation of tissues and the easy periosteal detachments.

5. Reduction can always be easily effected in recent luxation when an exact diagnosis guides the reduction maneuvers. Plaster apparatus is preferable to traction to secure the reduced position and eliminate the danger of re-luxation. In inveterate luxations, to the forced protracted reduction maneuvers, always useless and the frequent cause of grave complications, sanguinary reduction should be preferred as infancy offers the most favorable conditions for its success.

W. A. BRENNAN.

SURGERY OF THE BONES, JOINTS, ETC.

Bérard, L.: What Happens to Autoplastic Bone-Grafts in Free Transplantations (Que deviennent les greffes osseuses autoplastiques par transplantation libre)? *Presse méd.*, 1917, p. 281.

The author reports two cases of bone-transplantation. The first was in a man of 21 for loss of substance in the right radius. In this case the graft, about 10 cm. long, was taken from the left fibula of the same patient. This limb was well nourished and the patient was vigorous. The graft was deperiostized. At the end of one and a half years it was in perfect continuity with the two segments of the grafted bone.

In the other case a fibular graft, also about 10 cm. long, with its periosteum was inserted after the resection of 11 cm. of fractured tibia, which had occurred several years before. There had been dystrophic and other troubles since. By radiographic observation for a year it was seen that the graft took and lived. For three years the patient used the limb in walking, causing the formation of a solid callus. At the end of this time new phenomena of bony dystrophias were observed in the limb with absorption of the graft.

From his cases the author concludes that a free graft of a piece of fibula, with or without its periosteum, transplanted in the same subject for a loss of substance of 10 cm., whether of the radius or tibia of the opposite side, can live and replace the absent bone, participate in the formation of callus, or in the ulterior evolution of pseudarthrosis. When the transplantation is from a well nourished bone taken from a young and healthy subject it evolves to a reconstitution of a homogeneous and solid skeletal part. On the contrary when the restored bone belongs to a debilitated patient and is itself the seat of dystrophic disturbance, continuous or interrupted momentarily, the graft shares in the life and disease of this bone. As this graft is the least nourished part of the bone, it is the first to become absorbed and fragmented when the entire bone becomes the site of a progressively rarefying process.

W. A. BRENNAN.

Huggins, G. M.: Surgery of Amputation Stumps.

Lancet, Lond., 1917, cxcii, 646.

Based on the experience of 2,000 consecutive cases the author states that the surgery of amputations has entered a new era with the war: nowadays the aim of an amputation must include the ultimate fitting of the often delicate and complicated artificial limb which the modern instrument-maker produces. An amputation of the guillotine type is one in which the flaps have not been stitched up.

No secondary amputations should be performed in cases of guillotine amputations until all edema has disappeared and skin extension has been employed for six weeks.

Guillotine amputation stumps above the middle of the leg or the middle of the thigh should never be shortened until healed unless it is decided that the knee-joint or hip must be sacrificed. When shortening has to be done the minimum amount of bone necessary for utilizing the joint above should always be borne in mind. A guillotine amputation may make a satisfactory stump in the leg and thigh, and almost always does in the forearm and arm without further re-amputation.

Bone in a stump does not necrose unless infected. Delay in shortening stumps reduces the risk of infection, because infection is not in the wound alone, but in lymphatics leading from the wound. The amount of matting around the vessels leading to or from an amputation stump is very striking.

Silk should never be used for ligatures in operations on stumps. Amputations should be done by skin-flaps alone, and no muscle should be utilized in the flap, the pad of fibrous tissue formed over the end of the bone from the organizing clot being all that is necessary. All nerves, and not merely the main nerves, must be shortened at the time of the amputation or re-amputation.

To prevent deformity, daily exercising the joints and the employment of splints and bandages are essential measures in preparing the stump for the artificial limb.

A good Syme amputation leaves the patient with little disability, and amputations through the tarsus should never be done as secondary operations.

P. G. SKILLERN, JR.

Schiassi, B.: Biologic Treatment of Acute Surgical Infections of the Limbs (Trattamento "biologico" delle infezioni chirurgiche acute degli arti). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 44.

The author's method consists in immersing the infected limb in a warm bath for a period varying from eight to fifteen hours. The infected area is opened up and glass drainage tubes inserted. The solution used in the bath is made by the following formula:

Sodium chloride.....	8 gr.
Potassium chloride.....	0.3 gr.
Fused calcium chloride.....	1.0 gr.
Pure sodium hydrate.....	0.5 gr.
Sodium citrate.....	2.0 gr.
Glucose.....	1.5 gr.
Boiled water.....	1000.0 gr.

The chlorides are kept separate and each worked into the solution made from the other ingredients.

The bath is kept at a temperature of from 38 to 39.5°. The tubes are of special size according to the limb to be treated.

Schiassi affirms that the successes obtained by this method are infinitely better than those obtained with other methods. The good effects are due to three factors:

1. To the degree and duration of the active hyperæmia to which the diseased limb is subjected.
2. To the method of drainage which is instituted in the bath.
3. To the action of the hypertonic medicated solution.

The author has used the various other serologic and chemical preparations in vogue in the treatment of acute surgical infections, but he has never obtained such good results as from this method of treatment.

W. A. BRENNAN.

Dujarier, C., and Desjardins, A.: The Treatment of Osteopathic Fistulæ Following War Wounds (Sur le traitement des fistules ostéopathiques suites de blessures de guerre). *J. de chir.*, 1917, xiv, 1.

The authors call attention to the frequency of rebellious osteopathic fistulæ following fracture wounds. Their report is based on their experience with 69 cases.

The surgical treatment of fistula should consist in finding the cause of the fistula and totally extirpating it. This, however, is not an easy matter. The bone must be largely laid bare, following the fistula, step by step, enlarge the foramen, discover the sequestræ, and carefully clean the site; remove fungosities; follow up the trajectories excavating trenches in the bone; and stop only when the area shows healthy bone. After clearing the area it is necessary next to facilitate cicatrization. For this

an effort should be made to chip away the edges of the pits made in the bone, taking care to leave sufficient bone so as not to compromise the solidity of the limb. The mallet and gouge will be used in this preparation of the bone, care being taken to avoid leaving any incompletely detached bone pieces. The more smooth and more regular the osseous area and the more the edges are cut down, the more rapid will be the recovery.

The cleaning of the bone is followed by a thorough cleaning of the soft parts, removing all fibrous, periostic, and muscular excrescences. The soft parts must be clean and smooth in order to cicatrize easily. Counterincisions for drainage may be necessary.

The authors review the treatment in the case of particular bones.

After operation the cavity is washed out with Dakin's solution to remove any débris, then tamponed with compresses steeped in the same fluid. The dressings are left in place for five to seven days unless fever develops. The dressings are then renewed every second to fourth day and the parts washed with the Dakin solution. When the wound is in a good condition aseptic dressings are used. No grafts or plastics are resorted to.

The results obtained by the authors are as follows: operated, 69; sequestræ, 42; fungosities, 19; projectiles, 8. Of these, 57 have recovered, about four-fifths. Of the remaining 12 several show only an insignificant fistula and will certainly recover. The recoveries have been effected in a time varying from three weeks to six months: 7 in 1 month; 12 in 2 months; 19 in 3 months; 11 in 4 months; 5 in 5 months; 3 in 6 months.

The authors believe that relapse will occur in a certain number of the recovered cases. Infected areas in bone may remain latent for years and then break out. But better technique and greater facility on the part of the surgeon in discovering and eradicating the infected foci during operation lessens the chance of a recurrence. The authors have noted that their later results give more numerous and more rapid recoveries than their earlier interventions.

The particulars of the 69 cases are tabulated.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Davis, G. G.: Cure for Hallus Valgus; the Interdigital Incision. *Surg. Clin.*, Chicago, 1917, i, 651.

The author describes his operation performed on a patient who had a deformity of the foot resulting from a primary injury augmented by foci of chronic infection in other parts of the body. The patient had had "rheumatism," repeated attacks of tonsillitis, malaria, and gonorrhœa. All his toes were hyperextended and in the valgus position. He had a large callus on the plantar surface about the middle of the ball. Roentgenograms showed that the heads of the first, second, third, and fourth metatarsals

were markedly enlarged especially on the median and plantar aspects. The second and third toes were hammer-toes.

In this case the factors to be considered are trauma and focal infection. The trauma may have played a double part, first by the injury *per se*, and, second by causing a *locus minoris resistentiae* for the focal infection. The two possible sources of the focal infection are the tonsils, which have been frequently inflamed and the genito-urinary tract.

The operation is as follows: He makes an incision in the web between the first and second toes through which the head of the first metatarsal bone may be dislocated after the capsule of the joint has been opened. The enlarged part of the head of the first metatarsal is nipped off with a bone-cutting forceps in an oblique direction, taking more off on the median aspect of the bone than on the lateral, so that the hallux may be straightened or slightly overcorrected. The lateral phalangeal prolongations of the plastrar fascia are further divided and freed. A portion of the capsule, subcutaneous fat, and connective tissue is turned over the cut surface of the metatarsal bone to form a new joint. After the first metatarsal bone has been thus cared for the second metatarsal bone is dealt with in a similar manner through the same skin incision, which is to be closed with interrupted sutures. To approach the head of the third metatarsal bone and to deal with the callus, an incision is made in the web between the second and third toes. This incision continues on the ball of the foot to the callus, where it divides to encircle the callus which may then be excised. The head of the third metatarsal bone is removed and a portion of capsule with fat and connective tissue is again turned in over the cut surface of the third metatarsal bone.

When there is a marked hammer-toe condition with a semidislocation of the head of the first phalanx over the base of the second, it is necessary to resect the head of the first phalanx. The incision for this is made over the dorsum of the first interphalangeal joint. The incision between the toes and at the site of the callus is closed. Silk-worm tension sutures are needed to bring the edges together at the site of the removed callus.

Now that the heads of the metatarsals, which caused the hyperextension of the first phalanges, have been removed, and that the prolongations of plantar fascia, which caused flexion of the second and third phalanges, have been severed, the toes are readily brought down to their normal position or overcorrected. Dressings are applied and the foot is put in a plaster-of-Paris cast, with the toes in an overcorrected position of extreme flexion. The cast stays on until the stitches are taken out on the eighth day, when a light dorsal plaster-of-Paris splint is reapplied holding the toes in the corrected position. This is worn until the tissues have had a chance to firmly unite in the corrected position, when the splint is removed. This will be in three or four weeks.

PHILIP LEWIN.

Jarss, S. A.: Clinical Study of Four Hundred Cases of Anterior Poliomyelitis. *J. Am. M. Ass.*, 1917, lxxviii, 754.

In this study of cases brought to the dispensary on an average of ten weeks after the onset of illness, 8 per cent showed no evidence of muscle paralysis, while 78 per cent of the remaining 368 patients showed some involvement in the lower extremities, the muscles most often attacked being the tibialis anticus and the quadriceps extensor. In about 28 per cent the arm was involved, the deltoid being attacked most often.

A comparatively large number, 13 per cent, had cranial nerve involvement. It was found that the reaction of degeneration could not be relied upon as an index of the extent of muscle weakness. Talipes equinus was found in only a few cases, probably because it has been so well recognized as a possibility in these cases that preventive treatment was instituted. But in very few of the cases with paralysis or weakness in other parts of the body were any measures taken to prevent possible deformity, and as any joint in the body in any of its functional directions may be deformed and as every deformity results in stretched muscles which lessen the chances of recovery of function, it is very important that the possibility of deformity be recognized and preventive treatment given.

H. W. WILCOX.

Palmer, W. H.: Flat-Foot a Possible Cause of Synchronous Pains in the Sacro-Iliac Joints. *Internat. J. Surg.*, 1917, xxx, 199.

The author states there has been little written upon the subject. He believes the same factors which produce flat-foot might bring about a pelvic condition with relaxation of the sacro-iliac joints. Static conditions are the most common causes.

The traumatic (after Pott's fracture, contusion, rupture, or partial rupture of the muscles, or injury to the ligaments and nerves) occurs in 5 per cent of all cases; the paralytic (after infantile paralysis) in 3 per cent; the rickety (when the bones are softened in genu valgum, other signs of rickets co-existing) in 2 per cent; the static in 90 per cent. He quotes Magnuson as follows: "Probably more women have been operated upon for pelvic trouble because of flat-foot and flat back, than on account of any other poor diagnosis we have made."

One's attention would naturally be directed to the plantar arches when we encounter a history of pain in the feet and legs, which appears after walking. He reports two cases where correction of foot troubles relieved the backache.

PHILIP LEWIN.

Openshaw, T.: Amputation Considered from the Artificial Limb Point of View. *Lancet*, Lond., 1917, cxcii, 901.

In the upper extremity, one finger and the thumb are more useful than any apparatus, and if one can be left artificial fingers or thumb can be fitted and there is something to oppose the remaining digit.

Amputation at the wrist-joint should not be done if any portion of the hand can be saved for it gives too long a stump for an artificial hand. A new wrist-joint should be made by removal of one and one-half inches of the radius and ulna. The best site for amputation of the forearm is at the lower end of the middle third. If not more than two inches of the ulna can be left amputation should be done above the condyles of the humerus. Amputation at the elbow-joint should never be one of election.

The best site for amputation of the arm is between one and one-half inches above the elbow-joint and three inches below the axillary fold.

With regard to the shoulder, it is easier to fit an artificial limb to a stump where the head of the bone has been completely removed.

In the lower extremity, in all cases, no matter where the site, the nerve-trunks should be cut as short as possible and the end of the stump covered with a loose, movable, non-adherent skin-flap.

If the amputation has been of the digits of the lower extremity and the bone covered with the scar on the dorsum, an artificial boot can be fitted.

A guillotine amputation through the center of the tarsus is a temporary measure to be followed

by a Symes amputation. Neither a subastragaloid nor a Pirogoff amputation gives the most useful foot; the Symes amputation is the best.

Any amputation of the leg between the ankle-joint and a point six inches below the top of the tibia is likely to give an unsatisfactory stump. The best amputation of the leg is one where the bone is cut four to five inches from the upper edge of the tibia and the fibula cut a half inch shorter. Even one inch of the tibia if well covered gives a more useful stump than through or above the knee-joint.

A transcondylar amputation of the femur, if well covered, gives a good stump; at or above the middle of the femur every amputation case should be fitted with a pelvic band.

Amputations in the upper third of the thigh where the bone is divided at any point between the small trochanter and two inches below it, give a stump almost impossible to fit with an artificial limb. If more than two inches cannot be left, then the femur should be divided at the small trochanter or through the great trochanter. However, it is easier to fit an artificial limb where the bone has been exarticulated at the hip-joint, so that if a long thigh stump cannot be made there need be no hesitation in removing the upper end of the femur. V. C. HUNT.

SURGERY OF THE SPINAL COLUMN AND CORD

Young, J. K.: Lateral Deviation of the Spinal Column. *Med. & Surg.*, 1917, i, 38.

Lateral deviation is considered to be a pure side bending of the spinal column, with no rotation of the bodies of the vertebrae to distinguish it from scoliosis in which rotation is invariably present.

The condition may result from sacro-iliac disease, sciatic irritation or inflammation, tuberculosis of the spine, upward displacement of the ilium on one side, and compression fracture of the fifth lumbar vertebra.

In spinal tuberculosis the deviation is due to muscular spasm early in the process, while as a late deformity it is the result of destruction of the bone substance of the vertebral body. The deviation is the chief symptom, and the onset is always sudden. The diagnosis will be materially aided by an X-ray picture. The treatment is regulated according to the condition which caused the deviation.

H. W. WILCOX.

Henderson, M. S.: Tuberculosis of the Spine; End-Results of Operative Treatment. *J.-Lancet.*, 1917, xxxvii, 371.

The author reports 81 cases of Pott's disease operated upon from July, 1912, to July, 1916; 274 cases of tuberculosis of the spine having been observed in that time at the Mayo Clinic. The Albee operation was performed in 74 cases, and the Hibbs operation in 7. A careful follow-up record showed 7 deaths after operation up to the time of

publication. Of these, 2 were cured of the tuberculous spinal disease but died of miliary pulmonary tuberculosis. Of the 81 cases, 8 were not satisfactory to include in reports, therefore 73 cases constituted the report. Thirty-one, 42.2 per cent, were cured, and 33, 45.2 per cent, relieved. There were no operative deaths. Operation was not advised in young children, but conservative measures advocated. H. W. MEYERDING.

Pieri, G.: Injuries of the Spinal Medulla Produced by Modern Firearms (Sulle ferite del midollo spinale prodotte dalle moderne armi da fuoco). *Policlín.*, Roma, 1917, xxiv, sez. *prat.*, 764.

In the present war Pieri has observed 89 cases of spinal injuries with nerve symptoms. In 4 cases the lesion involved only the root; in 5 cases there were medullary compression symptoms probably due to fracture of a vertebral body by a projectile. In the remaining 80 cases there were symptoms of true lesion of the medulla or of the cauda. The study of these cases showed different mechanisms of the projectile action:

1. The projectile traversed the spine and directly hit the medulla or the cauda.
2. The projectile traversed the spine without either hitting the medulla or the meninges.
3. The projectile hit the apophyses, fractured them, and rebounding caused a severe indirect lesion of the medulla — 2 cases.

The anatomopathologic study of these lesions is based on 37 cases: 27 autopsies and 10 operative biopsies. In the cases of lesions clinically total in which the state of the medulla could be directly verified at autopsy, 19 cases, or at operation, 2 cases, the medullary lesion was observed under 7 types:

1. Complete section of the medulla and of the pia with diastasis of the stumps and lesions of the dura mater — 2 cases.

2. Apparently complete sections of the medulla but not of the pia, and lesions of the dura mater — 3 cases.

3. Subtotal section of the medulla but not of the pia — 1 case.

4. Complete perforation of the medulla, pia, and dura mater — 1 case.

5. More or less extensive disintegration of the medulla and of the pia with integrity of the dura — 4 cases.

6. Intraspinal softening of the medulla with integrity of the pia and dura — 5 cases.

7. Perfect necroscopic integrity of the medulla and of the meninges — 5 cases.

With respect to the symptoms, in the 80 cases 42 total lesions, 23 partial lesions, and 15 lesions of the cauda were clinically observed.

The results in the 80 cases were that of the 42 cases of total lesions, 30 died and 12 were transferred to other hospitals without evidence of amelioration; of the 23 cases of partial lesion, 4 died and 19 improved; of the 15 cases of cauda lesions 5 died and 10 improved. Of the 80 cases 16 were operated upon giving 10 deaths, 4 improved, 2 transferred unchanged.

The critical examination of the results obtained in the 16 operated cases, joined to the anatomopathologic study of the other cases leads the author to the conclusion that in cases of medullary lesions intervention is in general contra-indicated:

1. If the medullary lesion is total.

2. If the injury is transfossal.

3. If the projectile is without the rachidian canal.

Operation is indicated in the case alone in which the medullary lesion is partial and radiography demonstrates that the projectile is within the rachidian canal.

The author closes his communication by calling attention to the possibility in cases of total section of the medulla of indirectly re-establishing continuity between the upper and lower stumps, not by means of suture, but by anastomosis of the roots — Munro's operation — which was experimentally realized by Kilvington and others and in the human by Frazier and Mille in 1912. Gunshot injuries of the medulla present the most opportune anatomic conditions for this operation since the roots are not involved by the trauma.

In caudal lesions the author thinks that a late direct intervention by intradural section of the injured roots is authorized.

W. A. BRENNAN.

Elsberg, C. A.: Some Neurological Observations in 150 Laminectomies for Spinal Disease and Injury. *Am. J. Med. Sc.*, 1917, cliii, 781.

The author's experience in treating 150 patients with injuries or disease of the spinal cord which were operated upon during the past six years has led to the following observations:

1. Extramedullary tumors which develop under a chip of the dentate ligament do not often present early root pains because of the protection this ligament gives the posterior roots.

2. Large soft tumors do not as a rule give symptoms early while small hard tumors more readily cause pressure, etc.

3. In intramedullary cord tumors early root pains do occur and though the author has seen two such cases operated upon he appreciates that early root pains most frequently occur in extramedullary tumors.

4. Sensory disturbances may be late in appearing and repeated examination is required to discover them. Two cases are reported.

The author has noticed a number of patients suffering from a variety of diseases in whom disturbance of sensation was most marked on the anterior surface of the body; also if pain and thermal sensations were diminished the thermal changes were more marked than pain sensation.

H. W. MEYERDING.

Washburne, C. L.: A Case of Sarcoma of the Spinal Cord, with Operation. *J. Mich. St. M. Soc.*, 1917, xvi, 276.

The author reports a case of sarcoma at the seventh dorsal with a three-year history of pain in various parts of the back, during which time a normal child was delivered and a nephrectomy was performed on the right kidney.

An operation was performed the fourth year. Laminectomy was done and a bulging of the dura was noted at the seventh vertebra. Two tumors the size of a pecan and pea were removed. Examination showed the growth to be spindle-celled sarcoma, possibly arising from a neurofibroma.

At a second operation performed three months later, because of a marked spastic condition of the legs, no tumor mass was found beneath the dura nor at the site of the former operation. The twelfth dorsal sensory roots were cut on the left and the first sacral fourth to fifth lumbar root of the right cut, with some relief from spasm, but there was a recurrence of symptoms in the second week with flexure of the knees and pain. A third operation was done four months later and a section of the third sensory roots on either side gave relief from spasm. The patient has been more comfortable, except for a burning sensation in the thigh, leg, and foot. The sphincters are under good control, but whether the relief will be permanent remains to be seen. The result so far is gratifying.

H. W. MEYERDING.

SURGERY OF THE NERVOUS SYSTEM

White, J. R.: Operative Treatment of Injury of the Peripheral Nerves. *Brit. M. J.*, 1917, i, 388.

All wounds caused by present-day projectiles must be regarded as infected. Scar tissue formation is inevitable and in case of nerve injury may result in:

1. Complete separation of divided ends by scar tissue preventing regeneration.
2. Scar tissue between fibers or bundles of fibers producing spindle-shaped swelling.
3. Complete or incomplete replacement of nerve-fibers of the cross-section by scar in case of bruise to the nerve.
4. Scar tissue surrounding the nerve causing degeneration and atrophy.
5. Perineural adhesions arising probably from a cellulitis in the intermuscular planes in which the nerve lies.

In most cases there is a combination of several of these pathological conditions. Any operation in the presence of infection will only increase the scar tissue and should therefore never be done in the presence of micro-organisms. Furthermore, the healing of a wound is not very dependable evidence that bacteria are not latent in the tissues. But as nerve-suture should be carried out as early as possible, one must compromise. The nature and extent of injury, the amount of infection, and the length of period of healing furnish the criteria on which judgment is founded.

The division of the nerve may be anatomical or physiological. The treatment is in general operative in the one and expectant in the other. There is in the majority of cases no way of knowing with which one is dealing, but as a general rule cases which show no improvement during the period of healing or soon after belong to the first group.

In case of incomplete division, operation should be resorted to, if the remaining disability is serious or increasing or if there is persistent pain.

The removal of surrounding scar tissue, etc., in case of physiological division and restoring anatomical relations in a case of complete division and the protection of the suture line from fibrous ingrowths and of the exposed nerve from massive scar are the chief aims in operation.

In anatomical divisions the upper end is always bulbous and usually hard to find. It is best always to trace out the divided ends from recognizable nerve tissue above and below. Bulbous ends should be excised. In physiological division due to interstitial fibrosis, the spindle should be similarly excised and the nerve stretched and sutured. When due to strangulating scar tissue, this must be excised. If a long segment of nerve is involved nerve-transplantation or anastomosis may be indicated. Where the division is physiologically incomplete and when only a part of the cross-section

is replaced by scar the treatment is guided by the amount of loss of function present.

When after the maximum amount of stretching it is still impossible to approximate, flexion of the limb, etc., may help. Sometimes a shorter artificial path may be made. Strands of catgut to bridge the gap may be used when these devices fail. If the gap is considerable, nerve-transplantation or nerve-anastomosis is indicated. Nerve-transplantation is indicated when the distance to be bridged is short, where no suitable nerve is available, and when the affected nerve is of less importance than the nerve to which it would have to be anastomosed. The nerves most suitable for use as autogenous grafts are the radial and the external cutaneous of the thigh. Nerve-anastomosis is indicated when the distance to be bridged is more than three inches, when the neighboring nerve is of considerably less importance, of suitable size, and when a graft would have to lie in a mass of already present scar tissue.

The varieties of anastomosis recommended are insertion of the healthy distal end of the affected nerve into a longitudinal slit in the sound nerve or suturing it to a flap from the sound nerve, or both ends of the affected nerve may be inserted into slits in the sound nerve. In exceptional cases complete peripheral anastomosis between the central end of the sound nerve and the distal end of the affected nerve, may have to be done.

The question of wrapping material around the nerve-trunk is still *sub judice*.

Amputation, muscle-transplantation, or arthrodesis may be indicated in hopeless cases.

C. A. HEDBLÖM.

White, J. R.: Notes on Fifty Cases of Injury of the Peripheral Nerves. *Brit. J. Surg.*, 1917, iv, 607.

This account of fifty cases of injury of the peripheral nerve-trunks — the great majority being the result directly or indirectly of gunshot wounds — does not concern itself with such a complete story of the entire series of clinical and pathological phenomena as only a great deal of time and continuous observation, from the period of infliction of the injury to the termination in partial or complete recovery, would render possible. Under the conditions of war and active service neither such time nor such opportunity of observation were at the author's disposal. He gives, therefore, an account of the detailed clinical examination of the cases, combined and compared with the operative findings in many instances, with the object of gaining a better knowledge of the phenomena such injuries produce and thus ensuring greater accuracy of diagnosis and more skillful and efficient treatment. The paper contains much of value and importance.

EDWARD L. CORNELL.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS
ABSCESSSES, ETC.

Holding, A. F.: Results of the Treatment of Lymphosarcoma by Means of X-Rays and Other Methods. *Ann. Surg.*, Phila., 1917, lxxv, 686.

In the last four years the author has had an opportunity to observe the therapeutic results in over 700 cases of inoperable carcinomata, sarcomata, and allied conditions treated with X-rays, radium, toxins, etc. In 258 of these cases in which the diagnosis was verified by microscopical examination it was shown that primary improvement was common, though most of them eventually died of the disease. Of these cases, 35 were lymphosarcomata. From a study of the treatment of these cases it seems to the author that surgical excision is contra-indicated except in the very early and strictly localized forms of the disease, and such conditions can but rarely be demonstrated. The most effective treatment for lymphosarcoma at present is by the radio-active methods, and no treatment which does not include this method can be considered complete. In the hands of the author the toxins have rarely been of benefit, while X-ray and radium have produced benefit or recovery in nearly every case. The general condition of the patient usually improved with shrinkage of the palpable tumors. GATEWOOD.

Nogier, T.: Rational Treatment of Malignant Tumors (Traitement rationnel des tumeurs malignes). *J. de radiol.*, 1917, iii, 515.

Surgery alone according to Nogier fails to totally eradicate cancerous tumors and only postpones the fatal issue. Surgical intervention followed by radio- or radium treatment, in his opinion, never gives a definite recovery. He has treated some of these tumors for several years; but in the majority of cases there is no cure, only a prolongation of life.

Nogier thinks that the future will see the application of radio- or radium therapy before surgical exeresis and that the results obtained will be incomparably superior to those now obtained. After long experimentation both Nogier and Regaud have demonstrated that in animals enormous doses of filtered X-rays can be passed through the skin, sterilize thick neoplasms, and leave the skin intact and not specially liable to ulterior surgical trauma.

The procedure outlined is:

1. Before any surgical intervention on a neoplasm to practice ample intensive filtered radio-therapy.
2. To irradiate the tumor first, the surrounding regions afterward, and especially the lymphatic territories which are generally invaded.
3. To operate then early and remove everything macroscopically visible.

The reasons for and special advantages of these procedures are discussed and the author concludes that this method of treating cancer is the only rational method. It will not cure every cancer because there may be neoplastic cells too deeply situated to be sufficiently influenced by the rays; but it will cure many and in a definite manner. The author thinks therefore that the new rôle devolving on irradiation is to prepare for the work of the bistoury.

W. A. BRENNAN.

Sollman, T.: Developments in the Paraffin Treatment of Burns and Other Open Wounds. *J. Am. M. Ass.*, 1917, lxxviii, 1799.

Sollman summarizes his conclusions on the subject as follows:

Several refineries prepare paraffins of low melting point that are superior in their physical properties to any of the mixtures on the market.

The addition to paraffin of waxes, resins, etc., likewise antiseptics, etc., is superfluous. Attention is called to the fact that the same properties which make paraffin a perfect hermetic seal for chemicals prevent the absorption of such additions. The difficulties of the paraffin method are greatly reduced by employing liquid petrolatum instead of melted paraffin for the first coat. Further improvements may be attempted by the addition of antiseptics, stimulants, and especially anesthetics to the liquid petrolatum. Systematic comparison of the improved method with the older methods is desirable.

R. B. BETTMAN.

Beiter, J. R.: Paraffin in the Treatment of Wounds and Burns; Observations on Various Preparations. *J. Am. M. Ass.* 1917, lxxviii, 1801.

The paraffin dressing prevents granulation tissue from growing into the wound covering, as was the case with gauze dressings, and thus the dressing is not only more comfortable but healing is hastened, in as much as the new tissue is not torn and destroyed with each change of dressing.

The fact of the wound being hermetically sealed eliminates unpleasant odors, while the rigidity of the dressing acting as a splint adds to the patient's comfort. The scars resulting from this treatment are no different from those from other methods. Where wax has been used there may be fewer furuncles, although nephritis is probably just as common. Liquid petrolatum for the first coat greatly reduces the pain when applying the dressing.

The dressing is inexpensive but a time-consumer. Owing to the fact that this method has received so much favorable comment as to negligible scars, perfect comfort, and other extravagant claims, one who uses it for the first time may be disappointed.

R. B. BETTMAN.

Pike, F. H., and Coombs, H. C.: Relation of Low Blood-Pressure to a Fatal Termination in Traumatic Shock. *J. Am. M. Ass.*, 1917, lxxviii, 1892.

When the cells of the brain and medulla oblongata are deprived of blood for a period of from ten to twenty minutes, a change in the staining reactions of the cells is demonstrable if the brain and upper portion of the spinal cord are removed some minutes after the circulation to the head has been restored.

There is a greater susceptibility of these previously damaged cells to strychnine. Paralysis and failure of function from administration of strychnine during the resuscitation period occur more readily in the anterior (cephalic) portion of the central nervous system, which has been deprived of blood for a time, than in the posterior portion through which the circulation has been maintained continuously.

Such damaged nerve-cells will recover when a proper supply of oxygenated blood is provided. Respiration, blood-pressure, and pulse-rate soon become normal.

Transection of the spinal cord in the upper thoracic region may be done without fatal results some hours after the circulation to the brain has been restored. Transection of the spinal cord at this level in animals with brain intact is not ordinarily fatal.

Transection of the spinal cord is fatal if done soon after the re-establishment of the cerebral circulation, or if done soon after the return of the respiration and the blood-pressure to their normal conditions. Death follows in from five minutes to an hour.

Section of the spinal cord in the upper thoracic level lowers blood-pressure. Increasing blood-pressure by clamping or ligating the descending aorta just above the diaphragm will restore the failing encephalic (including bulbar) functions, if the increase is brought about soon enough.

In cases of severe damage to the cells of the central nervous system, no return of function, or only an extremely slow and imperfect return, is possible so long as the blood-pressure remains low. The conditions may be improved by increasing the blood-pressure artificially. The conditions become worse when a fall of blood-pressure is brought about by some means which does not involve transection of the spinal cord.

EDWARD L. CORNELL.

Symmers, D.: A New Interpretation of the Pathologic Histology of Hodgkins' Disease. *Arch. Int. Med.*, 1917, xix, 990.

The author concludes his discussion with the following summary: Hodgkins' disease is primarily neither an infective nor a neoplastic lesion of the lymph-nodes, but a systemic disease which expresses a predilection for lymphoid tissues, giving rise to multiple foci of growth at approximately the same time and in response to the same provocative agent. The provocative agent, whatever its nature

and origin may be, causes preliminary hyperplastic changes in the lymphoid tissues and initiates disturbances in the bone-marrow, characterized, among other things, by proliferation of the non-granular mononuclear cells of the lymphoid type, eosinophiles and eosinophilic myelocytes. These cells, together with the myeloplaxes, are thrown into the circulation and filtered out by the lymph-nodes or deposited in them in response to chemotactic attractions, the fibrotic changes in the recipient tissue representing a purely local reactive process.

The histologic changes beyond the lymphoid system proper, namely, in the liver, kidneys, etc., represent a reaction on the part of normally existing lymphomatous foci to the same toxic substance which is responsible for the disturbances in the bone-marrow and for the myeloid transformation of the lymph-nodes.

L. H. LANDRY.

Kramer, G. B., and Birnberg, T. L.: Case of Chloroma. *J. Am. M. Ass.*, 1917, lxxviii, 1900.

A girl, aged 4, was brought from an orphanage to the City and County Hospital, St. Paul, September 7, 1916, for the purpose of having her tonsils and adenoids removed. It had been noticed at the orphanage that the child's eyes were getting larger and more prominent. Several days after the operation, the child contracted chickenpox, from which she recovered rapidly. The physician in charge noticed that her eyes gradually became more prominent.

Examination of the eyes revealed choked disk. Exophthalmos of the eyes and enlargement of the head gradually increased, the glands of the neck and submaxillary glands became larger and hard, and the rami of the mandible of the jaw began to show more prominence. All sutures of the head began to separate and, between the sutures, a boggy mass about 3 cm. across was felt, the surface of which was smooth. Death occurred November 27, 1916.

At necropsy all the organs were found to be covered with greenish yellow areas. In the pancreas, kidney, liver, and spleen the yellowish areas were found throughout.

When the scalp was removed, the cranial bones were found to be separated and held firmly together by hard greenish tissue, 3.5 cm. in diameter and 1 cm. thick. The tumor mass extended more extracranially than intracranially; the bones were of normal thickness. On the dura there was a deposit of green tissue which followed the sinuses. Here, too, the tissue was 2.5 cm. across and 8 mm. thick. The dura between the tumor masses appeared normal. The base of the skull presented the same appearance as the cranial bones. The sutures were separated and between the sutures there was a greenish tumor. The orbits were filled with green tumor masses which caused the eyes to protrude. The ribs and costal cartilages were enveloped in a greenish-yellow tissue 3 mm. in thickness.

Microscopic examination of the tumor, bone,

meninges, brain, muscle, heart, lungs, liver, kidney, spleen, pancreas, and lymph-glands showed the tumor to be made up of lymphoid cells. Some of the nuclei of the cells were round and others oval. The cytoplasm varied in amount in different cells. In the areas in which the organs were involved, the cells formed dense masses and were held together by a delicate fibrous tissue network. The infiltrations of these cells were chiefly interstitial.

The anatomic diagnosis was general chloroleukosarcomatosis.

EDWARD L. CORNELL.

SERA, VACCINES, AND FERMENTS

Roser, C. E.: Toxicity of Heterologous and Homologous Serums. *J. Lab. & Clin. Med.*, 1917, ii, 536.

Serum toxicity involves two types of phenomena — primary toxicity and serum anaphylaxis. Primary toxicity is due to a heat sensitive toxin independent of hæmolytic, precipitins, agglutinins, and anaphylactins. In anaphylaxis the substance called forth by parenteral injections of the sensitizing dose may act under varied conditions as an agglutinin, lysin, or anaphylactin — since it is probable that the same element is concerned in all cases. The symptoms of anaphylaxis are almost identical for animals of the same species, but vary in different species. The mechanism of the production of the anaphylactic symptoms is still a matter of theory.

MAX KAHN.

Teague, O., and McWilliams, H. I.: Experiments with a Possible Bearing upon the So-called Non-specific, Intravenous Vaccine Therapy. *J. Immunol.*, 1917, ii, 375.

The authors have suggested the hypothesis that the intravenous injection of vaccine brings about a transfer of bactericidal substances — complement, or bactericidal antibody, or both — from the blood to the tissue fluids or lymph and in this way increases the resistance of the rabbit. According to this hypothesis the reaction should not be specific; bacillus coli as well as typhoid vaccine should be able so to affect the blood capillaries as to allow the passage of these substances through their walls. The author's experiments have demonstrated that the reaction is, in fact, non-specific in this sense.

The fact that our rabbits are rendered more resistant to typhoid by a preliminary injection of bacillus coli vaccine as well as by typhoid vaccine and that typhoid patients are cured by both kinds of vaccine makes it seem all the more likely that the same phenomenon is concerned in both reactions. The authors believe that their hypothesis offers the best explanation, not only of the new treatment of typhoid fever, but also of those other instances of so-called non-specific vaccine therapy; the bactericidal antibodies in each instance are probably transferred from the blood, where they are present in excess, to the tissue fluids where they are urgently needed. It is probable that the opsonins and other

antibodies, and perhaps complement, are similarly transferred and play a part in destroying the infecting organism in the diseased tissues.

The cure would be brought about then, after all, by means of specific antibodies and our ideas with regard to immunity reactions would not have to undergo a radical reversion as has been predicted by some writers.

L. H. LANDRY.

BLOOD

Neymann, C. A.: Changes in the Blood Picture After Nucleic Acid Injections. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 146.

The author notes that during the last decade many workers have reported, some favorably and others unfavorably, concerning the therapeutic action of nucleic acid in those diseases which theoretically ought to be influenced by an increase of the leucocytes. It is not the author's purpose in this report to discuss this issue, but rather to direct attention toward some changes in the blood picture which he believes should not be neglected, especially when repeated injections of nucleic acid are given.

Schittenhelm and Bendix, using the rabbit as an experimental animal, found that nucleic acid in itself was not very toxic and that it was very slow to be absorbed. When it was injected subcutaneously or intramuscularly, indurations resulted. Intravenous injections, except in minute quantities, caused acute nephritis.

As the author had the treatment of patients in view primarily, the use of the intravenous method of application was precluded. He also employed rabbits in the first test work, using the sodium salt of nucleic acid, and adding to this sodium cinna-mate, arsenic, and quassia, according to the formula originated by Lundvall, and recently recommended for the treatment of dementia præcox by Bayard Holmes. The mixture was made according to the following prescription, which the author refers to as Lundvall's solution:

Quassini depurati sicci	2.0
Aquæ destillatæ bullientis, q. s. ut fiat	50.0
Boil in a water bath for one and a half hours, filter, and add	
Hetoli (i.e. sodii cinnamati)	1.0
Sodii nucleinati	10.0
Acidi arsenosi (in solution)	0.005
Boil until all is dissolved, filter, and add	
aquæ destillatæ bullientis, q. s. ut fiat	50.0

The author observed the action of this solution on a series of animals, and finally having gained some experience with its action he next decided to apply it to the treatment of patients. One represented a depressive paranoid reaction type; one a hysterical reaction type with schizophrenic features; one an undoubted schizophrenic reaction type; and the last a depressive reaction type with marked schizophrenic features.

As to the psychic behavior of the patients, it can be best characterized, the author states, as similar to that which would be expected after any shock. The injections were very painful. The rise in temperature of from two to three degrees caused a feeling of being ill at ease, with headache and nausea as accompanying factors, and the whole procedure, necessarily carried on in spite of the protests of the patient, was a cause for excitement. As a result of this shock the patients transferred their attention to the difficulties caused by the treatment and placed their own internal difficulties more in the background. Thus, the three schizophrenics who showed a catatonic tendency, were more inclined to talk, and were generally brighter during the twenty-four hours directly following a treatment, whereas the depression paranoid reaction case, whose worries were centered on the imaginary prospect of being put in jail and castrated, now worried about the time of the next treatment.

The injection of Lundvall's solution caused an increase in the number of leucocytes, which leucocytosis lasted from one to two days. The patient developed a tolerance for the solution, the author found, and the hæmoglobin decreased alarmingly if the treatments were repeated at close intervals.

GEORGE E. BEILBY.

Koehler, E.: Intragluteal Injections of Non-defibrinated Blood for Secondary Anæmia.
Muenchen. med. Wchnschr., 1916, lxiii, No. 48.

Koehler reviews the methods of blood-transfusion and their disadvantages. Against the disadvantages of the intravenous methods he contrasts repeated subcutaneous and intramuscular injections of small quantities of blood. This method is simpler because it does not call for consanguineous blood; and it is less harmful inasmuch as accessory phenomena are not usually observed even after repeated injections. Ziemssen was the first to adopt subcutaneous injections of defibrinated blood, afterward using non-defibrinated. Huber later on showed the innocuity and efficacy of intramuscular injections of defibrinated blood. He and others obtained successes in anæmia with intragluteal injections.

Koehler reports two cases, one in a woman of 38 with secondary severe anæmia, septic streptococcal endometritis, and bacteræmia. Intragluteal injections of 15 to 20 ccm. of heterogenous blood, non-defibrinated, were made at three-day intervals until a total of 150 ccm. were injected in eight treatments. The condition improved progressively with the injections.

The second case was a severe menorrhagic anæmia in a girl of 16 in which there was an equally good result, with homogeneous non-defibrinated blood.

In the first case where there was not alone an anæmia, but a septic process as well, the author believes that the injections helped the organism in its struggle against the toxin. Although two cases are not of great significance, yet inasmuch as others

have also obtained good results from intragluteal injections of blood in anæmia, the author has thought it well to report them.

The technique is very simple. The blood is aspirated by a sterile syringe from a vein of the donor in the desired quantity and at once injected into the gluteal region of the patient, making sure, however, that the needle does not involve any vessel.

W. A. BRENNAN.

Fullerton, A., Dreyer, G., and Bazett, H. C.: Observations on Direct Transfusion of Blood; Description of a Simple Method. *Lancet*, Lond., 1917, cxcii, 715.

After a rapid and severe hæmorrhage the main indication is to administer fluid by intravenous saline. If the hæmorrhage has been severe, recurrent, or has occurred in a patient already anæmic, the hæmoglobin may be reduced below that sufficient to maintain life. The authors believe that when hæmoglobin falls below 20 per cent transfusion is imperative. If the percentage remains between 20 and 30 any length of time transfusion should be performed. Blood with a percentage of 40 is sufficient to carry on oxidation with the patient at rest. Surgeons in the war area show that septic wounds improve more rapidly by transfusion, even with a hæmoglobin of 40 per cent or over.

In the selection of donors, men who are unfit for duty because of some slight injury are generally used. The possibility of tuberculosis or syphilis is excluded, but no tests for hæmolysis nor agglutins are made.

Transfusion is effected from a small artery to a vein. The apparatus consists of two glass or silver cannulæ connected by a seven-inch length of india rubber, the whole being coated within and without by a thin layer of wax made by mixing hard and soft paraffin.

The patient and donor are placed side by side with the arms to be used placed parallel to each other. The radial artery and one of the veins at the bend of the elbow are used. Local anæsthesia is used and the vein and artery are dissected out and both vessels ligated at their distal ends and a light bull-dog forceps placed on the proximal ends of each. A V-shaped incision is made in each vessel and the cannulæ inserted; the bull-dog forceps are removed and the blood allowed to flow; at the close of the operation the vessels are ligated proximal to the injured portion and cut.

The onset of anæmic symptoms in the donor indicates that he has lost as much blood as he can afford, and in a man of average weight this will occur when he has lost about 1000 ccm.

The symptoms in the recipient that call for cessation of transfusion are rigors, precordial pain, increase in pulse-rate.

In the donor the hæmoglobin percentage begins to rise about the fourth day and is practically normal at the end of three or four weeks.

The results are: Of the 16 reported cases, 1

received no blood, because of undetected obliteration of the recipient's vein. In 3 cases the patients were beyond hope of recovery and transfusion was given as a last resort; 4 cases made rapid progress due to transfusion; 7 cases are dead, of which 4 showed decided improvement which was not maintained, in 2 others slight improvement occurred. In 1 case death was probably accelerated by the transfusion. Serum reaction occurred in 2 cases, being fatal in 1 of these thirty minutes after the beginning of transfusion.

V. C. HUNT.

Moss, W. L.: Simplified Method for Determining the Iso-Agglutinin Group in the Selection of Donors for Blood-Transfusion. *J. Am. M. Ass.*, 1917, lxviii, 1905.

Depending on the ability of the serum to agglutinate the corpuscles of other individuals and of the corpuscles to be agglutinated by the serum of other individuals, every person falls in one of four groups:

Group 1. Serum agglutinated no corpuscles. Corpuscles are agglutinated by the serum of Groups 2, 3, and 4.

Group 2. Serum agglutinated the corpuscles of Groups 1 and 3. Corpuscles are agglutinated by the serums of Groups 3 and 4.

Group 3. Serum agglutinated the corpuscles of Groups 1 and 2. Corpuscles are agglutinated by the serum of Groups 2 and 4.

Group 4. Serum agglutinates the corpuscles of Groups 1, 2, and 3. Corpuscles are agglutinated by no serum.

In a previous publication the author has pointed out that the group of any individual may be determined by testing his corpuscles against known Group 2 and Group 3 serum or by testing his serum against known Group 2 and Group 3 corpuscles. This is illustrated by tables which show all the possible results and the group to which x belongs for each result, x being the individual whose group is to be determined.

The test is easily performed in the hanging drop, which requires but a few minutes to set up, and the presence or absence of agglutination is observed under the microscope.

Group 2 and Group 3 serum may be kept on hand in the laboratory ready for use; it is then necessary to get only a single drop of blood in salt solution for corpuscles in order to determine the group of any individual.

A satisfactory technique requires: Group 2 serum; Group 3 serum; capillary pipettes; hollow-ground slides; cover slips; test-tubes; physiologic sodium chloride solution, 0.85 per cent; microscope.

The collection and preservation of Group 2 and Group 3 serum is accomplished thus: Five ccm. of blood are withdrawn from an arm vein of a Group 2 individual and the same amount from a Group 3 individual, placed in sterile centrifuge tubes, allowed to clot, centrifugalized, and the serum transferred to other sterile tubes. From the latter, capillary pipettes are to be filled.

A number of capillary pipettes are prepared from glass tubing 3 or 4 mm. in diameter by drawing each end out into a capillary. The capillary at one end is cut off within 1 inch of the body of the tube. That at the other end is left 6 or 8 inches long. These are sterilized and half are used for the Group 2 and half for the Group 3 serum, the long capillary stem being filled half full of serum, the tubes tilted so that the end of the column of serum will be about an inch from the end of the capillary and then both ends of the tube sealed in the flame. Two file marks on the glass indicate the tubes containing Group 2 serum and three marks those containing Group 3 serum. The tubes are stored away in boxes at room temperature, but protected from the light. These tubes may be kept in the laboratory and are ready for immediate use whenever required. Serum preserved in this way retains its agglutinating power six months or longer.

With Group 2 and Group 3 serum on hand, the determination of the group of any individual is easily and quickly done. A single drop of blood from the finger-tip or ear is allowed to fall into a test tube containing 8 to 10 ccm. of physiologic sodium chloride solution, 0.85 per cent. The tube is shaken or rotated in order to obtain a uniform suspension. On each of two cover slips a very small drop of the corpuscle suspension is placed by means of a capillary pipette or platinum loop; to one a drop of Group 2 serum is added and to the other a drop of Group 3 serum. The serum and corpuscles are mixed on each cover slip, inverted over a hollow ground slide and examined under the microscope. Agglutination may take place in a few minutes at room temperature, but it is a safe rule to allow half an hour at 37° C. to elapse before concluding that there is no agglutination.

EDWARD L. CORNELL.

Tarr, E. M.: A Satisfactory Method of Obtaining Blood for Diagnostic Purposes in Infancy; Preliminary Note on Longitudinal Sinus Transfusion. *Canad. M. Ass. J.*, 1917, vii, 226.

Tarr states that the use of the longitudinal sinus for withdrawal of blood and transfusion in infants is safe, simple, and practicable. It can be done at home or in the Out-patient Clinic, as well as in the hospital, and very little assistance or paraphernalia are required.

He describes the technique as follows: an ordinary 5 ccm. Luer syringe and a short hypodermic needle of rather large caliber are boiled for ten minutes. The infant is wrapped in a blanket, and the area over the fontanelle is cleansed with soap and water, and alcohol. Shaving is not essential. With the index-finger of the free hand the posterior angle of the fontanelle is located. Keeping in the median line the needle is introduced as close to the angle as possible. On entering the sinus one gets the same definite sensation of being within the lumen of a vessel as one does in piercing the dura in lumbar puncture. Gentle and even traction of the plunger

will bring forth a steady stream of venous blood. Blood should be drawn before making an injection in order to demonstrate that the sinus has been emptied.

The author has entered the sinus 207 times for the withdrawal of blood, with but 3 failures. He has administered by this route dextrose solution 64 times, salvarsan in 9 cases, and sodium bicarbonate in 19 cases.

He concludes that intravenous medication may be attempted by the general practitioner under ordinary circumstances, and that transfusion should be added as a therapeutic measure in the treatment of many diseases including hæmorrhagic disease of the new-born, primary hæmorrhage, toxic and septic acute infectious diseases, and marasmus.

ALBERT EHRENFRIED.

Sydenstricker, V. P. W., Mason, V. R., and Rivers, T. M.: Transfusion of Blood by the Citrate Method. *J. Am. M. Ass.* 1917, lxxviii, 1677.

Transfusion of blood has been made simple by the use of anticoagulants, and citrate of soda has been shown to be the best and least toxic. Two grams of sodium citrate given intravenously often causes chilly sensations and fever. However, in transfusion work 2 grams are practically never given at one time, as blood can be kept fluid by 0.25 per cent.

Donors should be carefully selected and all transmissible diseases excluded. A Wassermann test should invariably be made on the donor's serum. If cardiacs are used, a bacterial endocarditis should be excluded by blood culture if necessary. Malaria should be avoided by history and examination of the blood.

After a healthy donor is secured, agglutination tests should be properly carried out. This is done by mixing a drop each of the donor's serum and the recipient's corpuscles suspended in physiological salt solution, and vice versa, and incubating them for one hour at 37° C. Agglutination may take place quickly but some severe reactions may be avoided if all tests are allowed to stand a full hour.

Human bloods fall into four groups. Group IV corpuscles are not agglutinated by any other group's serum. Consequently Group IV blood can be used in any case without a severe reaction being expected. Still it is better to centrifuge the citrated blood, pipette off the serum and increase to volume with physiological salt solution before giving.

The technique of citrate transfusion is very simple. It can be done anywhere by one person if necessary and the blood can be kept on ice for a number of hours without danger. The blood is drawn from the donor's median basilic vein by light suction into a graduated bottle mixing the citrate solution gradually by running it in through a graduated separating funnel. Ten ccm. of 2.5 per cent sodium citrate solution will keep 90 ccm. of drawn blood from coagulating. After the blood

is drawn, it is transfused to an infusion bottle of a salvarsan apparatus and run into the recipient's median basilic vein.

Since the introduction of the citrate method into this hospital, thirty-four patients have received a total of one hundred transfusions. The procedure has been carried out in a variety of conditions, as pernicious anæmia, secondary anæmia, burns, leukæmia, sepsis, typhoid fever, and uræmia. The indications and results are the same as have been reported by other authors using the older methods.

Reactions after transfusions of all kinds are very interesting, some are certainly due to carelessly performed agglutination tests, while others occur when the bloods match perfectly by the routine tests. As the question of reactions after repeated transfusions and often after the first transfusion of compatible blood is very interesting and little understood, the remainder of the abstract will be taken directly from the original paper:

"The symptoms following transfusion of blood are in order of frequency: malaise, slight elevation of temperature, chilly sensations, actual rigor, urticaria, pruritis, nausea, vomiting, lumbar pain, dyspnoea, cyanosis, and hæmoglobinuria. Any single one or combination of these symptoms occurring within three hours after a transfusion has been considered a reaction. Such symptoms have been present in 17 per cent of cases. Most of the reactions were trivial, none fatal. In every case the bloods were compatible by the routine tests.

"The cause of these reactions is not definitely known. Typical anaphylactic-like reactions of mild grade are not uncommon and are quickly relieved by a hypodermatic injection of adrenalin. Three followed the transfusion of washed cells. One occurred in a patient with typhoid fever, following transfusion from a convalescent typhoid patient. Garbat has observed slight chills and some elevation of temperature following the intravenous injections of two grams of sodium citrate. In none of these cases has more than 1.75 grams of citrate been used. This quantity would hardly account for the symptoms. The reactions seem to bear no relation to the volume of the transfusion, many having followed small ones.

"In this connection two cases of pernicious anæmia are of some interest. Mrs. J. B. received 9,000 ccm. of blood by the Lindeman method between December 10, 1915, and February 14, 1916, without any severe reactions. During this admission her spleen was removed. She was readmitted in August, 1916, with extreme anæmia. Citrate transfusions from her husband and brother (both had been donors several times previously) were followed by severe almost fatal reactions with hæmoglobinuria. A Lindeman transfusion, using a new donor, was followed by a chill, high fever, coma, and death. There was marked hæmoglobinuria and hæmoglobinæmia. The case of H. A. P. is similar in many respects. Splenectomy and repeated transfusion had been performed during previous ad-

missions. Following a citrate transfusion from a previous donor he had a severe reaction, chill, stupor, and hæmoglobinuria. A new donor was secured but a similar reaction followed. No more transfusions were attempted.

"These two cases have suggested the possibility of the formation after repeated transfusion of antibodies to homologous blood which are not demonstrable *in vitro*. In both after the occurrence of severe reactions, tests were done with particular care. Gross and microscopic preparations were made with varying dilutions of the donor's and recipient's sera. These were incubated 1 hour at 37° C., then put on ice for twenty-four hours and again incubated. There was no agglutination or hæmolysis. Similar tests were done in the choosing of subsequent donors with negative results, yet transfusion from these donors gave most severe reactions. Without attempting to explain these, it would seem that transfusion is a self-limited method of treatment in pernicious anæmia since, after a certain number of transfusions homologous blood may cause reactions of increasing severity. We have been unable to produce any similar result experimentally in normal animals."

POISONS

Campbell, A. R., and Dyas, A. D.: Epidemic Ulceromembranous Stomatitis (Vincent's Angina) Affecting Troops. *J. Am. M. Ass.*, 1917, lxxviii, 1596.

During the four months, October, 1916, to February, 1917, 129 cases of this hitherto rare condition have been seen. The authors endeavor to give the results of the routine, laboratory and ward observations, which, though incomplete, may be of value in Canada and the United States after the conclusion of the present conflict, whither, doubtless, the infection will be carried by the returning troops.

Type 1. The largest percentage of cases are of tonsillar type.

Type 2. The next most frequent type is a deep ulcer on the ramus of the lower jaw, immediately behind the last molar tooth.

Type 3. Pyorrhœa caused by Vincent's organisms is also frequent.

Type 4. General infection of the mouth is the severest type of all and the patient is acutely ill. The membrane extends over the cheeks, tongue, fauces, pharynx, and palate, and even to the lips.

For ulcerations about the mouth and tonsils, the routine treatment is liquor arsenicalis (*liquor potassii arsenitis*) swabbed on three or four times a day. Where the ulcer is deep and spreading rapidly, it is first well swabbed with 10 per cent silver nitrate solution, and the treatment continued with liquor arsenicalis.

In pyorrhœa the mixture recommended by Bowman is employed: vinum ipecacuanhæ 0.5 ounce; glycerinum 1 dram; liquor arsenicalis, sufficient

to make 1 ounce. A few drops are poured on the patient's toothbrush and the gums well brushed with it two or three times a day. It is surprising how quickly the lesions will disappear under this treatment, a severe acute pyorrhœa being completely cured in five or six days. In general stomatitis and gingivitis the patient should be given large doses of liquor arsenicalis internally, sodium cacodylate hypodermically, or salvarsan. He also should frequently use a soothing antiseptic mouth wash until the condition is sufficiently under control to permit local treatment. The great majority of cases are cured in from four to seven days.

EDWARD L. CORNELL.

Schamberg, J. F., Kolmer, J. A., and Raiziss, G. W.: Experimental and Clinical Studies of the Toxicity of Dioxydiamioarsenobenzol Dichlorhydrate. *J. Cutan. Dis.*, 1917, xxxv, 286.

Salvarsan may be used in concentrated solutions up to 0.6 gms. in 10 ccm. in animals without any evident increase of toxicity.

The failure to neutralize solutions of salvarsan with alkali leads to an increase in toxicity of 50 to 60 per cent in solutions of 0.5 to 1 per cent concentration.

The addition of a moderate excess of alkali beyond the amount required for neutralization does not increase the toxicity, as determinable by the duration of life of the experimental animal. It is possible, however, that it may have other untoward effects.

The use of sterile, fresh distilled water appears to possess advantages over sterile, stale distilled or non-distilled water as regards toxicity, although the difference is not pronounced.

Salvarsan in alkaline solution tends to undergo oxidation on standing, with consequent increased toxicity, but this substance and its congeners vary considerably in the rapidity of oxidation and in the degree of associated toxicity. The drug should be used reasonably promptly after preparation. If two or three hours' delay is unavoidable, the solution should be kept in a cylinder, full to the stopper, so that no air is present.

Several different types of reactive symptoms may occur after the use of salvarsan: (1) immediate, (2) early, and (3) delayed. The immediate symptoms are due to a paresis of the blood-vessels; the early symptoms coming on a few hours after the injections are febrile and gastro-intestinal, and the delayed symptoms may be referable to the brain or the liver and gastro-intestinal tract.

There is no one cause of reaction. The etiologic factors in the production of reactive phenomena may be related to (1) the patient, (2) the technique, and (3) the medicament. The most important factor in the causation of reactions is referable to the drug. The immediate vasoparetic reactive symptoms are due to traces of an unidentified impurity in the drug.

Salvarsan and its congeners are not compounds of

absolute chemical purity. Therefore, absolute constancy in biological effects cannot be expected.

Salvarsan and its congeners may vary, with certain limits, in therapeutic effect, and to a greater degree in toxicity. The ampoules obtainable in the open market exhibit striking variations in toxicity.

Even the poorest compounds, however, are tolerated by animals in much higher amounts than the maximum dose administered to man, so that there is nearly always a latitude of safety.

The commercial products should be tested out intravenously as well as subcutaneously, and they should be tolerated by rabbits in the dose of 60 mg. per kilo of body weight.

Salvarsan is a safer substance than mercury and can be tolerated intravenously by white rats in fifty times the dose of the latter, weight for weight.

EDWARD L. CORNELL.

Brunzel, F.: Local Tetanus. *Berl. klin. Wchnschr.*, 1916, liii, No. 40.

Brunzel reports the case of a soldier who after being wounded displayed symptoms of tetanus which was evidently local, there being none or only very slight general manifestations. After treatment by serum the man appeared to be out of all danger when suddenly the temperature rose and within a couple of days he died in delirium cordis, fifteen days after the last serum injection.

Autopsy showed the heart, brain, lungs, etc., quite normal and the cause of death was not determined. It must be admitted as very probable that the death of the patient was due to the tetanus poison, notwithstanding the large dosage of antitoxin administered. The author thinks the case of interest not merely because it is one in which the tetanic symptoms were purely local, but more so on account of the delayed death which occurred notwithstanding the fact that the local tetanic symptoms had disappeared for twelve days and that there were no general symptoms clinically recognizable.

It is possible that in this case there may have been a question of a particular variant of the tetanus bacillus, the toxin produced having a predilection for the nerve-centers of the heart since the death was a sudden cardiac death.

The case is of particular interest to surgeons because the prognosis of a purely localized tetanus cannot *à priori* be said to be favorable. The local form is only a special form of the general type which is always local at first. The evolution of any particular case cannot be foretold so that it is best to treat all cases alike energetically.

W. A. BRENNAN.

Dean, H. R.: A Report on Twenty-five Cases of Tetanus. *Lancet*, Lond., 1917, cxcii, 673.

Dean reports a series of twenty-five cases of tetanus treated during an interval of four months at the Second Western General Hospital. The

majority of the men had been wounded in the battle of the Somme. Most, if not all, had probably received prophylactic injections of antitoxin in France. All had suppurating wounds but, in the majority of cases, they were like the average case sent to a hospital in England. It is significant, however, that a compound fracture was present in 11; in 2 a leg had been amputated; and in 7 there was a history of foreign body in the wound. In these cases there was probably dead tissue present providing a suitable medium for the growth of the saprophytic tetanus bacillus. Presence of fracture or foreign body therefore constitutes a strong indication for prophylactic antitoxin injection. The length of time elapsing between injury and dressing does not seem to be a factor in the incidence of infection.

The incubation period in many of these cases was enormously increased. In 10 cases it was over fifty days. In 5 cases it was about three months. In 9 the wounds, at the time of onset of symptoms were completely or almost completely healed. In at least 5 cases the wounds were such that probably no one would have selected the cases for prophylactic treatment. This latency of infection is due to the prophylactic injection. Unless this fact is recognized, incipient cases will be overlooked and valuable time lost in instituting treatment.

The earliest signs may be rheumatic pain and stiffness. Of the 25 cases, 6 received aspirin at the onset. Or the first symptom may be tonic or clonic contraction of muscles in the immediate neighborhood of the wound, usually in the nearest flexor group. In 4 of these cases it remained so localized, in 10 others it finally became generalized, and in 11 there was sudden involvement, first of muscles of the jaws and neck. Some of these had received prophylactic injection.

Of 5 mild cases treated by intramuscular injection, all recovered. Of 14 serious generalized cases treated by intravenous injection, 13 recovered. Of 5 treated by intrathecal, with or without other injection, 3 recovered.

The choice of method of injection should be governed by the essential principle of treatment which is to neutralize the toxin at the earliest possible moment. This object can be most easily attained by the intravenous route. The subcutaneous and intramuscular injections are absorbed but slowly and valuable time is lost. As regards the regulation of the size of dose the intrathecal method is the least advantageous. In 5 of the cases injected intravenously cerebrospinal fluid was obtained by lumbar puncture and antitoxin demonstrated by injection into animals. It is obviously desirable to distribute antitoxin to every part of the central nervous system. The arteries and capillaries afford ideal channels for such distribution. It is difficult to believe that serum injected into the lumbar theca reaches the cells in the medulla more quickly than serum which is injected into a vein.

From experimental study of the blood serum of

7 of the patients it was determined that from twenty to thirty-nine days after injection of 30,000 units the blood of the patient may contain appreciable quantities of antitoxin. This, together with clinical evidence in 6 of the patients who received only one injection and who promptly recovered, would seem to indicate that there is no advantage in frequent injections of serum.

C. A. HEDBLOM.

Andrewes, F. W.: The Intrathecal Route for the Administration of Tetanus Antitoxin. *Lancet*, Lond., 1917, cxcii, 682.

The relative merits of the subcutaneous, intramuscular, intravenous, and intrathecal methods of administering tetanus antitoxin practically cannot be determined by the statistical method. The primary object always being to cure the patient, more than one route is employed, and wide variation occurs in the dosage. The cases differ widely in the severity of infection and in accidental complications and the more heroic method of injection is apt to be chosen in the most desperate cases.

Reliable data is, however, available from animal experimentation. Permin of Denmark showed that antitoxin intrathecally prevented tetanus when intravenous injection did not. Park and Nicoll injected two minimal lethal doses of toxin into guinea pigs, waited until spasm of the legs commenced, and then tried antitoxin by various routes. In experiments on 18 guinea pigs, 2 controls and 6 treated by the intracardiac and 4 by the intraneural routes, all died, while of 6 receiving much smaller intrathecal doses 5 recovered. Shorrington working with monkeys found that 10 control monkeys and those treated subcutaneously all died. Of 12 treated intramuscularly all died. Of 16 treated by intravenous injection 10 died, 62.5 per cent. Of 18 treated by the intrathecal route 5 died, 27.7 per cent.

The author reports 20 cases, 16 of which were treated intrathecally, with 2 deaths. He believes there is less danger of aphylactic reaction by intrathecal than by intravenous injection and that the danger of meningeal infection with ordinary care should be negligible. An insufficiently treated case of local tetanus tends to become general. The intrathecal rather than the subcutaneous route should therefore be chosen in all incipient cases. Except in established cases the intrathecal method seems safer in local tetanus also because of the tendency to become general.

C. A. HEDBLOM.

Gow, J.: A Case of Tetanus Treated by Intrathecal and Intramuscular Injection of Antitoxin. *Lancet*, Lond., 1917, cxcii, 689.

A soldier with multiple superficial shrapnel wounds of both hands and left thigh reached the base hospital five days later when he was treated by saline fomentations and baths. Two weeks after the injury he developed trismus and tonic and clonic spasm of the right arm and hand. He grew worse in spite of 5,000 units of antitoxin injected into the spinal theca in the lumbar region and

10,000 units intramuscularly. The next day he received 4,500 units between the first and second dorsal vertebrae after preliminary withdrawal of spinal fluid. Improvement began forty-eight hours later. Intramuscular injections of 4,500 to 5,000 units were given daily the next four days. On the eighth day a serum rash appeared and he seemed worse. Another dose of 4,500 units was again injected into the subarachnoid space between the first and second dorsal vertebrae. After twenty-four hours the patient was better and convalescence progressed to complete recovery.

C. A. HEDBLOM.

Golla, F.: A Comparison of Subcutaneous with Intravenous and Intrathecal Administration of Tetanus Antitoxin in Experimental Tetanus. *Lancet*, Lond., 1917, cxcii, 686.

Tests on rabbits and cats show an indubitable superiority of the intravenous and intrathecal route over the subcutaneous, possibly due to the slower absorption by the latter route. The whole problem of serum therapy seems to be to cut off a fresh supply of toxin by bringing antitoxin into relation with the focus of infection. The toxin apparently cannot be neutralized after it has entered the central nervous system.

The prophylactic administration of serum has converted man from a susceptible to a resistant organism evidenced by the occurrence in the majority of cases of local spasm of muscles supplied by the spinal segment directly in nervous continuity with the wound—a clinical picture previously very rare in man but common in highly resistant animals.

The toxin may remain localized or invade the whole nervous system. It is therefore of greater importance to use the more rapid intravenous or intrathecal methods in those not having received prophylactic treatment, but the more rapid method is also the safer in either group.

C. A. HEDBLOM.

Fraenkel, E.: Intracranial Subdural Injections of Antitetanic Serum. *Muenchen med. Wchnschr.*, 1917, lxiv, No. 7.

Although Gottlieb and Freund obtained excellent results in animal experimentation from intradural injections of antitetanic serum, most authors have failed to get good results in human patients. These failures were due to various causes:

1. The late use of the antitoxin.
2. The need of a larger dosage of antitoxin to saturate the toxin.
3. The fact that the antitoxin failed to reach the anatomic situation of the toxin.

For these and other considerations the author has adopted direct injection of the antitoxin (after trepanation) into the subdural space of the two hemispheres.

In order to make a better distribution it is advisable to first withdraw from 20 to 30 ccm. of cerebrospinal fluid by lumbar puncture, and inject curative serum instead. Before the treatment the patient is anæsthetized. The author cites some

cases of severe tetanus treated very favorably in this way.

According to the author single subdural injections of 20 ccm. of curative serum into the lumbar canal, and into the subdural space of the two hemispheres suffice to interrupt the disease. Since this relatively small dosage applied at the correct point is sufficient, Fraenkel believes that the reason why the intralumbar application of serum has not been successful heretofore is that there was an anatomical insufficiency.

W. A. BRENNAN.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Symmers, D., and Fraser, A.: The Significance of Embryonal Fat Cells in Certain Pathologic Conditions. *Arch. Int. Med.*, 1917, xix, 699.

The conclusions reached by the authors are:

1. Histogenesis of fat cells is brought about in two ways:

(a) Connective tissue cells set apart in embryonal life for the purpose of producing fat.

(b) Result of metaplasia of fibroblasts with accumulation of fats in the cytoplasm.

2. In marantic infants there is a condition attended by extensive hyperplasia of primitive fat organs resembling new-growth.

3. Glandula insularis cervicale of Pende (described as endocrine body) is identical in the structure and function with embryonal fat organs.

4. There is a group of chronic productive inflammatory lesions and a variety of lipoma attended by marked hyperplasia of embryonal fat cells, in which these cells sometimes display a tendency to migrate into alien tissues. The histology is so indicative of chronic productive inflammatory process attended by extensive hyperplasia of embryonal fat cells, as to suggest transformation into sarcoma (embryonal cell liposarcoma — malignant lipoblastoma).

5. Embryonal fat cells are phagocytic and may form multinucleated giant cells around fat globules and the like or may form giant cells by repeated cleavage of the nucleus with corresponding changes in the cell body, or giant cells may result from the fusion of embryonal fat cells.

6. Giant cells seen in tissues of regressing corpus luteum are built around foreign bodies in the form of cholesterol crystals, and stellate radiations seen in the cytoplasm are probably fatty acid crystals due to disintegration of the fat cells of the part.

MAX KAHN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Opie, E. L., and Allison, N.: Hypertrophic-Chondrodystrophy in Infancy and Adolescence — a Progressive Anomaly of Osteogenesis. *J. Med. Research*, 1917, xxvi, 277.

The disease now usually designated chondrodystrophy or achondroplasia is characterized by

disturbance of the growth of cartilage associated with abnormal development of those bones which are formed within cartilage. The arms and legs remain short because replacement of cartilage by bone does not proceed with normal activity at the epiphyses and there is early cessation of endochondral ossification. The bridge of the nose is retracted because the base of the skull which is laid down in cartilage does not attain its usual length. It is now recognized, as the authors state, that the disease which was formerly designated foetal rickets has no close similarity to rickets.

They report the case of a male child, aged three months, as a typical instance of hyperplastic chondrodystrophy. The child was apparently still in good health.

Chondrodystrophy of hypertrophic type characterized by excessive proliferation of cartilage may persist, the authors state, throughout adolescence and give rise to extensive hypertrophy of the epiphyses and adjacent ends of the diaphyses. There was progressive proliferation of both articular and epiphyseal cartilage and bone formation occurred at the edge of the proliferating cartilages, but multiplication of cells failed to produce the regularly disposed rows of cells characteristic of the longitudinal growth of bone. Small areas of cartilage were found isolated within the bone which had been formed and by proliferation this cartilage penetrated between the adjacent fat cells of the marrow. Absorption of bone accompanied its new formation and osteoporosis was a conspicuous feature of the disease. The bones were not always diminished in length and in one case which was described the long bones were abnormally long in proportion to the trunk, but the projecting forehead suggested that the growth of the endochondral bone at the base of the skull had been somewhat retarded.

The foregoing observations seemed to the authors to establish the occurrence of hypertrophic chondrodystrophy as a disease of post-foetal life, and show that associated abnormal endochondral osteogenesis may persist throughout adolescence. The disease, they believe, is an inborn and progressive anomaly of endochondral bone formation.

GEORGE E. BEILBY.

Novy, F. G., and De Kruif, P. H.: Anaphylatoxin and Anaphylaxis. *J. Am. M. Ass.*, 1917, lxxviii, 1524.

During the past three years, an intensive study of anaphylatoxin and anaphylaxis has been carried out in the Hygienic Laboratory of the University of Michigan, a short summary of which is herewith given.

It has been known for some years that the normal serum of the guinea pig when incubated for some hours with various bacteria, trypanosomes, agar, starch, etc., acquired a poisonous property which was designated as anaphylatoxin because the effects suggested some relation to those observed in acute anaphylactic shock.

In the course of work on the immunity of animals against the pathogenic trypanosomes it was frequently noted that repeated injections of the dead organisms caused severe toxic symptoms and even death. Because of this complication it was not possible to produce a high degree of immunity in the treated animals. Hence it became necessary to ascertain the nature of this poisoning.

Accordingly, the relation of trypanosomes to anaphylatoxin production was studied, and this work led to similar investigations with agar, bacteria, peptone, etc. Two very important facts were learned and these proved to be of great value in the further study of the toxicity of normal blood and serum, and in that of specific anaphylactic shock.

In the first place it was found that the poison production occurred at great speed. Under proper conditions a harmless normal serum could be rendered fatally and acutely toxic in two or three minutes. This speed of poison production in the test-tube corresponds to that which actually obtains in anaphylactic shock. A second fact of equal importance was the recognition that rat serum was capable of yielding more anaphylatoxin than any other serum. Where workers hitherto have had to content themselves with a poison which killed in a dose of 2 or 3 cubic centimeters it was possible to have one which caused acute death in a dose of 0.25 and even 0.15 cubic centimeter. With the powerful anaphylatoxin obtained from rat serum it was feasible to do some tests otherwise impossible.

Agar was used in much of the work on anaphylatoxin and since the addition of this seemingly inert substance to a serum rendered it poisonous it was reasonable to expect that the intravenous injection of agar would give rise to the same poison in the animal, and hence that an acute non-specific anaphylactic shock would be induced. This was found to be the case; acutely fatal, typical anaphylactic shock can be produced by injecting agar into guinea pigs. Noteworthy is the fact that the amount of agar necessary to evoke a fatal shock is less than that of the pathogenic bacteria. And further, the immediate effects produced by an intravenous injection of bacteria are the same as those produced by injecting agar, or anaphylatoxin. Very rapid transfusion of blood from the heart of the animal which receives the agar injection into the vein of a new guinea pig results in an acute fatal shock. In this way it was established that the agar acted in the animal in the same manner as in the test-tube, i.e., it gave rise to anaphylatoxin.

It is to be noted then that agar produces the same poison as do bacteria. This poison hitherto has been supposed to be within the bacterial cell and has therefore been called "endotoxin." The fact that agar can produce this same poison goes to show that the old view is fundamentally wrong.

It has been known for a long time that intravenous injection of peptone gave an incoagulable blood, drop in blood-pressure, and even death. The

similarity of these effects to those in acute anaphylactic shock has led to the view that in specific shock peptone or like products were formed and caused the toxic effects. Peptone is by no means as toxic as agar. It must be used in a dose several hundred times larger than the latter. It was possible to show that the addition of peptone to rat serum in the test-tube actually gave rise to anaphylatoxin; and further, the animal which received an injection of peptone, by blood-transfusion, was shown to contain anaphylatoxin in its blood. In other words, the toxicity of peptone was due, like that of agar, to the production of anaphylatoxin.

A normal blood which in a given dose is perfectly harmless provided it is injected at once, may become acutely fatal if it is kept in the syringe for about three minutes. This pre-coagulation toxicity is due not to the injection of fibrin ferment but to the formation of anaphylatoxin. After the removal of the clot some of this poison persists in the serum. Hence it is that a serum always possesses a certain degree of toxicity. The degree of toxicity depends to some extent upon the mode of defibrination. It may also depend upon conditions which affect the animal. Thus, perfectly normal rabbits will yield sera of varying toxicity; the serum of one may have no effect when injected in a dose of 6 ccm. while that of another may kill in a 1 ccm. dose. It is noteworthy that in cachectic conditions the toxicity of the blood is greatly increased.

In specific anaphylaxis where a guinea pig which has received an injection of serum or egg-white is reinjected about two weeks later with a second dose of the same material, it was possible to show that anaphylatoxin is likewise produced. A rapid transfusion of the blood of the shocked animal reveals the presence of the poison. Similarly, when the serum of the sensitized animal is mixed with the antigen in the test-tube anaphylatoxin is produced within two or three minutes, the speed being the same as when agar or peptone is employed. Particularly important was the fact that the serum of a sensitized rat on dilution with distilled water and short incubation yielded the same anaphylatoxin. This fact disproves the theories of absorption; it likewise disproves the view that the poison arises from the antigen.

It is evident that a new and broad principle underlies these phenomena. The blood is known to contain an unstable protein, fibrinogen, which readily changes into a tautomeric modification, i.e., fibrin. A similar unstable body is the matrix of the poison. The catalyzing action of various substances and foreign cells readily changes this matrix into anaphylatoxin. Hence the importance of recognizing the fact that more or less poison may be formed in the circulation. If the amount is large it may lead to shock effects similar to those in eclampsia; the continued action of small amounts may lead to cachexia and like conditions.

The fact that the addition of sodium carbonate to a serum renders it incapable of producing anaphyla-

toxin, and the further fact that the addition of this alkali to anaphylatoxin itself tends to destroy it, may serve as a basis for the rational use of alkali as a curative and preventive agent in those conditions which are due to the blood disturbances in which this poison forms. This condition of the blood due to anaphylatoxin or taraxin may be designated as taraxy.

Noguchi, H.: Spirochæta Icterohæmorrhagiæ in American Wild Rats and Its Relation to the Japanese and European Strains. *J. Exp. Med.*, 1917, xxv, 755.

In America, especially the United States, there have been few epidemic or endemic cases of infectious jaundice reported from various quarters of the continent (Toronto, Middle Western and Southern United States) and from Cuba, but it was not known whether or not these cases corresponded with those found in Europe and Asia. With the discovery of the specific pathogenic agents it is now possible to answer this question experimentally.

A large number of wild rats were collected in this country and their kidneys removed for the purpose of ascertaining whether or not the organs contained the spirochæta which caused the typical experimental lesions characteristic of the organism of infectious jaundice. Leaving the experimental details for a future communication, the author here states briefly that by inoculating the emulsion made of the kidneys of 41 wild rats into 58 guinea pigs during a period of three months, he has been able to produce in three groups of guinea pigs (four in each group) a typical icterohæmorrhagic spirochætositis altogether identical with the findings in the guinea pigs which died of the injections of the Japanese and Belgian strains of spirochæta icterohæmorrhagiæ.

The finding of the causative organism of infectious jaundice among wild rats in America, and the identification of this strain with those found in Asia and Europe seemed to the author to be particularly important in revealing a latent danger to which there is constant exposure but from which escape is possible as long as sanitary conditions are not disturbed by untoward events. The principal points brought out by the author are:

1. Wild rats captured in this country carried in their kidneys a spirochæta which possessed the morphological and pathogenic properties characteristic of spirochæta icterohæmorrhagiæ discovered by Inada in the Japanese form of infectious jaundice.
2. Cultures of the American, Belgian, and Japanese strains of the spirochæta were obtained by a special technique described, the first two strains having been cultivated artificially for the first time.
3. Animals actively immunized against the Japanese strain resisted inoculation, not only of the same strain, but also of the Belgian and American strains. The Belgian strain produced immunity equally effective against all three strains. Experi-

ments to ascertain whether the immunity afforded by the American strain also protects against the Japanese and Belgian strains are in progress.

These findings, the author believes, warrant the conclusion that the spirochæta designated here as the Japanese, Belgian, and American strains are probably identical. On account of its distinctive features, a new genus, leptospira, has been suggested as the name of this organism. **GEORGE E. BEILBY.**

Nathan, P. W.: Arthritis Deformans as an Infectious Disease; an Experimental and Clinical Study from the Carnegie Laboratory (University and Bellevue Medical College) and the Montefiore Home and Hospital for Chronic Diseases. *J. Med. Research*, 1917, xxxvi, 187.

The author, after a study of these conditions for a number of years, has been forced to the conclusion that the various anatomical, particularly the histological abnormalities, although characteristic in themselves cannot be brought in correspondence with specific etiological factors, clinical entities, or even definite pathological entities. This he finds more particularly true of the polyarticular joint conditions. In these, he states, the pathological processes in the various joints often present dissimilar or opposite conditions, and there may be purely atrophic and purely proliferative conditions or combinations of the two in the joints of the same individual, and though there may be only synovial changes in some, and only osseous changes in others, combinations of such changes are often to be found side by side in the different joints of the same individual. He states, therefore, that it is impossible without leading to confusion to divide the joint diseases according to these pathological findings, because there are no joint diseases which are exclusively degenerative or exclusively proliferative; the one or the other may predominate in a particular joint, he believes, but there are evidences of both these conditions in practically all joint diseases.

The author has been able to demonstrate that such degenerative changes may be preceded by intense inflammatory conditions in a number of cases, although he does not deny the existence of a primary degenerative process in joint structures.

From an exhaustive study of the subject, which included a number of experiments, Nathan states that it is fairly certain that all the various forms of polyarthritis may be caused by infections. The pathological lesions, he believes, correspond exactly with those of known infections and the clinical phenomena can all be ascribed to differences in the location and virulence of the bacteria, the mechanical conditions and the presence or absence of central or peripheral nerve involvement. The classification of the so-called arthritis deformans into definite infections and problematical metabolic disturbances he therefore considers no longer necessary so far as the joint conditions are concerned. It must either be assumed, he says, that all forms of polyarthritis are due to infections or that all deleterious substances, what-

ever their nature, will cause fundamentally the same general changes in the articular structures.

In this connection he draws attention to the fact that though it is not unlikely that a focus in a tooth is sometimes and one in the throat often is the point of entry for bacteria, it should be remembered that once the micro-organism has entered the blood its connection with the portal of entry ceases. For this reason, he says, though the removal of the affected teeth or tonsils will, if these are really the site of the original focus (which is by no means always certain, he states, even when they are abnormal) prevent reinfection or recurrences, such procedures have absolutely no influence upon the joint condition as it already exists. He deplors the fact that this is seldom made clear to patients who are persuaded to resort to surgical measures in these organs. Moreover, he states, it should be remembered that a focus in the joint structures, like a focus anywhere else, besides causing local changes, may be and no doubt often is a source of general infection and metastases.

When the fact that the joint condition — either non-articular or polyarticular — may remain active and progressive though the general condition has subsided, that the local joint condition varies according to the virulence (but not the cause of the infection), the termination, the mechanical condition in the joint and the concomitant conditions, there need no longer be any difficulty in understanding and caring for the co-called rheumatoid polyarthritides.

In conclusion, as regards the treatment of the conditions discussed in this paper, he states that some years ago he strongly advocated the use of thymus extract in the treatment of these diseases. At that time he stated that this substance was not a specific, and from what has been said in the foregoing pages of this article there can of course be no doubt in regard to this. The fact, nevertheless, remains that thymus seems to him to have a very definite beneficial effect upon the nutrition and he still finds that in those cases in which the joints are not destroyed or ankylosed (providing it is long continued and the routine dieting and mechanical treatment which are so harmful are omitted), it nearly always, he states, leads to more or less complete recovery. As the author says when the mechanical functions of the joints are impaired the problem becomes a mechanical one, depending upon the mechanical conditions not only in each case but in each joint.

GEORGE E. BEILBY.

RADIOLOGY

Harrison, F. C.: The Use of Radium in Postoperative Conditions. *Internat. J. Surg.*, 1917, xxx, 98.

Radium was first used therapeutically in the treatment of superficial skin lesions such as port-wine stains, naevi, angiomas, keratoses, chronic eczemas, keloids, and cutaneous epitheliomata. It was found to have a very distinct value in the treatment of these hitherto intractable disorders. Its action

in skin cancer naturally led to its employment in more serious malignant conditions — obviously the first cases in which this new agent was employed were those in which all other customary measures had failed. Even in these hopeless cases remarkable results were noted. These patients having been so much benefited, in a short time radium therapy was being employed as the method of choice in certain cases. In other cases it was used as a prophylactic against recurrences after surgical operations. The observations cited were made in the practice of W. H. B. Aikins of Toronto during the past seven years.

The changes in carcinomatous growths after exposure to radium have been found by Aikins and Simon to be as follows:

1. The cells diminish in size and staining properties.
2. Absorption of the protoplasm and nuclei by granular degeneration and leucocytic infiltration.
3. Arrest of development of the tumor and organization of vascular connective tissue.

In sarcoma the size of the body and nucleus of the large cells decreases. With this shrinkage the neoplastic elements elongate, the nucleus becomes regular, and the cells eventually assume the form of large embryonic connective-tissue cells, similar to a true fibroma. Radium thus transforms a sarcoma into tissue analogous to a fibroma.

It should also be borne in mind that there is a possible blood-immunity produced by the use of radium.

Basal-celled epitheliomata usually respond satisfactorily to radium treatment alone.

Squamous-celled epitheliomata should first be excised and afterward submitted for radium therapy.

In epithelioma of the lip the growth should be excised and the lip and adjacent lymphatic channels draining from that area radiated.

An interesting case of squamous-celled epithelioma of the nasal fossa is reported. This growth had recurred several times after cauterization but disappeared entirely under cross-fire radiation, one plaque of radium being placed externally and another in the nose and against the ulcer. The total dosage was 100 milligram hours.

Another case of epithelioma inside the cheek is reported. The growth was excised but recurred within two weeks after operation. Under cross-fire radiation, the mass disappeared and at the end of two months was perfectly well.

A case of epithelioma of the floor of the mouth and involving the frænum, after excision was given 130 milligram hours as soon as the stitches were removed. After 3.5 months the mouth was entirely well but there was an enlarged gland in the neck. This was radiated and ten months later, the patient was well.

Another very satisfactory case was one of epithelioma of the palate which had ulcerated into the nose. Excision was performed which however was incomplete. After treatment with radium the parts healed over and except for perforation of the palate the patient has entirely recovered.

After amputation of the breast for carcinoma radium should be used as a prophylactic against recurrence. Several cases are reported in which the axillary glands were badly involved at operation and one of recurrence in the axilla after operation, all of which recovered after treatment with radium. Small recurrences in the scar after breast amputation respond beautifully to radium treatment.

In cancer of the rectum, if inoperable, much good can often be done by the use of radium. Where only a partial operation is possible radium has a wonderful influence on the unremoved portion of the growth.

In inoperable cases of cancer of the uterus, radium causes a relief from pain, the hæmorrhage and discharge are arrested, a shrinking and fibrosis takes place in the growth to such an extent that operation is made possible.

The author quotes Wickham and Degrais, Abbe, Fabre, Schmitz, Gauss and Kelly as favoring the use of radium as a supplementary procedure following operation. In treating uterine cases only the penetrating rays are used and the radium is therefore enclosed in platinum capsules. These rays have been shown to exert their influence for a depth of 3.5 inches. An exposure of 600 to 750 milligram hours is given and is repeated at intervals of four to six weeks.

The author reports 4 cases of cancer of the uterus, vagina, and vulva in which radium was used with satisfactory results. Small round cell sarcoma, lymphosarcoma, and spindle-cell sarcoma not springing from bone all respond to radium treatment. An infant with spindle cell sarcoma alongside the anus which had recurred twice after operations, healed up and has remained well for six years following the application of radium.

Two cases of sarcoma of the jaw are reported, one recurrent after three operations, after radium applications now well for seven years, the other where only partial removal was possible, now well for eighteen months.

A case of round cell sarcoma of the humerus after operation and radiation with radium tubes inserted into the tissues and also applied externally has now been well for over a year.

G. W. GRIER.

Delavan, D. B.: Radium in Carcinoma of the Upper Air Passages. *Med. Rec.*, 1917, xci, 1130.

A brief report is given of 184 cases of carcinoma of the upper air passages treated with radium at the Memorial Hospital in New York City. Cases of carcinoma of the lip, nasal mucosa, superior maxilla, floor of the mouth, soft palate, tonsils, pharynx, tongue, and larynx are listed and the results obtained described and tabulated. Favorable as well as unfavorable cases were treated to ascertain the palliative and also curative action of the radium.

The results seem to indicate that by far the best results are obtained by the prompt treatment of early cases. In the most favorable cases reported,

the retrogression has been produced by a single treatment.

Inside the mouth and in mucous membranes generally, it is questionable, unless a retrogression can be obtained in a few doses, whether or not it is best to undertake the treatment of the case at all. In advanced cancer any temporary benefit from radium is overshadowed by the later progressive extension of the disease. Generally speaking, enough has been and is being accomplished to offer abundant encouragement for the present and brilliant hope for the future.

ADOLPH HARTUNG.

MILITARY SURGERY

Mioni, G., and Francini, M.: Craniocerebral Surgery in the Advanced Sanitary Unit (La chirurgia cranio-cerebrale nelle unità sanitarie avanzate). *Policlin.*, Roma, 1917, xxiv, sez. prat., 798.

Mioni treated 133 cases of craniocerebral injuries. In these 30 craniotomies there were 7 deaths through meningo-encephalic complications. In 22 similar interventions Francini had 6 deaths.

Mioni thinks that in general all cranial lesions, except in the case of moribund patients, should be immediately operated upon. However, if the entry orifice is very small, the wound transfossal, and there are no bursting phenomena or symptoms of compression, the patient might be left without intervention, being carefully supervised and removal avoided during the first week at least.

Francini is of the opinion that in every head lesion when symptoms of encephalic troubles exist, and although at the direct examination a fracture is not evident, craniotomy should be done; that every cranial lesion even if without cerebral symptoms should be subjected to exploratory incision of the soft parts in order to establish the integrity of the cranial cavity; that every cranial fracture thus established even in the absolute absence of cerebral symptoms is a precise indication for craniotomy.

W. A. BRENNAN.

Santy, P.: Treatment of Shock in the Severely Wounded at the Front (Le traitement à l'avant du shock chez les grands blessés). *Lyon chir.*, 1917, xiv, 54.

The author's treatment of shock is based on his experience in the advanced surgical posts near the firing line. In cases of compound fractures with extensive destruction of the soft parts serious hæmorrhage is always observed even if the main vessels are not injured. Such hæmorrhage is not usually of long duration, being counteracted by a fall in blood-pressure and contraction of the vessels. In this condition the patient before transportation usually has a normal temperature, and the pulse though weak is of good quality. He is not yet in a state of shock. Initial shock is rare, and shock after hæmorrhage is a secondary phenomena, which, according to the author, is provoked by cold, transportation, and pain.

It is important to combat shock as rapidly as possible, treating the patient close to the firing line. Santy's treatment consists of: (1) heating the patient in a warm room; (2) keeping the head in a low position to prevent anæmia of the medulla oblongata; (3) repeated intravenous injections of warm saline solution in small doses with adrenalin, beginning with 500 cubic centimeters and one fourth of a milligram of adrenalin. The injection is repeated every 6 hours with 250 cubic centimeters salt solution and one-fourth milligram adrenalin.

The general effects are that the blood-pressure increases, the temperature becomes higher, and respiration is regular. This early treatment saves the lives of many and permits the surgeon to undertake necessary operations. To render the treatment possible it is necessary to organize emergency posts close to the front, where the badly wounded can be kept for some days. W. A. BRENNAN.

Interallied Surgical Commission on Treatment of Wounds. *Bull. méd., Par., 1917, p. 125.*

The Surgical Commission appointed by the allied nations to discuss the treatment of wounds and of which Professor Tuffier was appointed president arrived at the following conclusions at its first meeting March 15.

1. It is desirable that the organization of service be so arranged as to permit a continuity of surgical direction in the treatment of the wounded.

2. In the fighting posts, and especially in the trenches, surgery should be reduced to the minimum. It must be limited to dealing with complications which may be immediately mortal and to the cleansing of wounds. The wound should neither be explored nor irrigated. It should simply be protected by a dry aseptic or antiseptic dressing.

3. It is essential to transport the wounded as quickly as possible to one of the large hospitals at the front which are situated at from 10 to 20 kilometers from the firing lines.

4. It is advantageous that each of these hospitals should have one or several attached advanced annexes, nearer to the firing line, so as to quickly receive certain classes of severely wounded, those in shock or attacked by severe hæmorrhage, thoracic, or abdominal injuries, etc.

5. Generally speaking war wounds should be considered as contaminated or infected.

6. The object of treatment should be: (1) to prevent infection of the wound if only contaminated, or to obtain sterilization if infection is evident; (2) to permit suturing when clinical sterilization has been obtained.

7. Wide opening up of the wound with resection of contused tissue, removal of débris of clothing, etc., should be considered a matter of course, with exceptions only in certain cases which can be rigidly supervised.

8. After such intervention immediate suture is capable of giving favorable results, especially in articular wounds. It should be executed only in cases in which the wound is but of a few hours' duration, maximum 8 hours, and when the surgeon can continue supervision of the patient for fifteen days.

9. If immediate suture is not done secondary suture must be resorted to when sterilization of the wound is sufficiently clinically evident.

10. Evolution of the wound should be systematically controlled by periodical bacteriological examinations which will allow the construction of a microbial curve and determine the degree of sterilization.

11. When there is necessity of evacuating patients whose wounds have been opened up and excised, a dressing should be applied, the action of which would continue during all the time of transport. There is need of research in this respect.

12. Several methods of progressive sterilization of wounds exist, which permit secondary suture regularly.

W. A. BRENNAN.

GYNECOLOGY

UTERUS

Outerbridge, G. W.: The Simultaneous Occurrence of Carcinoma and Sarcoma in the Uterus. *Am. J. Obst.*, N. Y., 1917, lxxv, 575.

The author reports two cases of combined carcinoma and sarcoma of the uterus. The first occurred in a woman 73 years of age. The uterus was enlarged, owing to the presence of a partially necrotic submucous tumor, which consisted of sarcomatous and carcinomatous elements, and had apparently arisen from sarcomatous degeneration of a submucous myoma, with carcinomatous degeneration of the overlying endometrium. In the second case which occurred in a patient 48 years of age there was a small but definite area of adenocarcinoma in the fundus removed by curettage. On examination of the uterus after subsequent hysterectomy the site of the small area of carcinoma was clearly distinguishable, but no further carcinoma could be found. A small intramural nodule, lying on the posterior uterine wall, was found histologically to be a myoma with areas of definite sarcoma.

In a series of 27 cases of combined carcinoma and sarcoma collected from the literature, cases of complete separation of the two types of tissues, as Case 2; of their intimate commingling, as in Case 1; and of all possible intermediate conditions are to be found. It seems, therefore, that even when the two tissues exist intermingled in one tumor mass they have probably arisen separately and subsequently grown together, so that "carcinoma-sarcoma" can hardly be considered a distinct pathological entity. The condition is rather rare, and occurs, as a rule, fairly late in life. In malignancy it is comparable to carcinoma or sarcoma alone, but metastases and recurrences usually show only sarcoma.

C. H. DAVIS.

Weiner, S.: Superficial Adenocarcinoma Corporis Uteri. *N. Y. M. J.*, 1917, cv, 1079.

The author reviews and contrasts the pathogenesis, signs, and symptoms of cancer of the uterine body and cervix, respectively.

Since to the history and palpatory findings it is necessary to add microscopic examination of the curettings for a certain diagnosis of cancer of the uterine corpus and since examination of the uterus removed subsequent to such a curettage has at times shown the organ either freed or nearly freed of cancer by the curette, interest attaches to the possible curative removal of cancer of the corpus by curette alone. Ladinski, Frank, and now the author report cases in which such cures might

possibly have been effected because of the limited superficial nature of the cancerous invasion of the corpus.

Examination of the author's case showed a movable uterus with negative palpation of the adnexæ in a woman past the menopause who had had eight weeks of increasing uterine hæmorrhage. Curettage removed much friable tissue, which was confirmed as adenocarcinoma by the microscope. Abdominal section showed no involvement of the retroperitoneal lymph-nodes or adnexæ; and the uterus and appendages were removed, not by a Wertheim, but by the usual panhysterectomy technique. Examination of the uterus following operation showed its walls thickened and sclerosed but the endometrium normal except for a small sessile polypoid mass well up toward the fundus. Microscopic examination of this mass showed it to be adenocarcinoma but showed no involvement of the endometrium elsewhere and no involvement of the uterine muscle at all. Vaginal examination five months later was negative as to any induration or masses. The author holds that it would be feasible to totally remove such a growth by curette. This he believes to be one of the earliest adenocarcinomata of the corpus on record. However, he still clings to the wisdom of the dictum that the presence of any adenocarcinomatous tissue in the uterus demands the removal of the entire organ.

JESSE D. COOK.

Huggins, R. R.: Tissue Tone as an Index of Vital Resistance, with Special Reference to Prolapse of the Uterus. *Am. J. Obst.*, N. Y., 1917, lxxv, 545.

One of the great handicaps of surgical work is the difficulty in making an estimate of the ability of the patient to withstand certain operative procedures necessary to restore health.

Independent of the usual contra-indications, such as damaged kidneys, lungs and marked cardiac disease, there is a condition which is characterized by poor tone throughout the entire muscular system, including the heart, which is most difficult to measure. The heart sounds may appear normal, but if studied carefully the heart shows marked absence of muscular tone and seems flabby. When further examination reveals this condition throughout the body it is of great prognostic importance.

The surgeon must decide how far and with what speed a given heart can be driven and keep the patient within the limits of safety. The study of the author's cases indicates that in addition to the failure of the heart muscle there may be such an exhaustion of the muscular structures of the stomach and intestines that death ensues from paralytic ileus.

The author believes that muscular tone should be carefully determined prior to deciding on the time for an elective operation. Accurate observations of the blood-pressure with particular attention to the pulse-pressure is made both before and after exercise. He believes with Barringer that in the pulse-rate and blood-pressure reactions to graduated work we possess a valid test of the heart's functional capacity. If the systolic blood-pressure reaches its greatest height not immediately after work, but from 30 to 120 seconds later, or if the pressure immediately after work is lower than the original level, that work, whatever its amount has overtaxed the heart's functional capacity and may be taken as an accurate measure of its efficiency.

In elective surgery, these studies will lead to delay in cases where prolonged rest in bed or other suitable measures are necessary to bring the resistance of the patient to a point where operation may be undertaken with the least risk. It will compel one to select the anæsthetic which throws the least amount of work on the heart muscle and the one which lessens shock and postoperative stress, for in many instances it holds the balance of power.

C. H. DAVIS.

Williams, J. T.: Retroversion of the Uterus: Its Etiology and Rational Treatment. *Boston M. & S. J.*, 1917, clxxvi, 558.

After discussing the subject the author gives the following conclusions:

1. Retroversion of the uterus may be divided into three classes: (a) inflammatory, (b) congenital, and (c) acquired.

2. In retroversions of the first class, treatment is directed primarily to the inflammatory process and the displacement is corrected only incidentally.

3. Congenital retroversions are usually symptomless and require no treatment.

4. Retroversions acquired as the result of parturition should be considered as a step in prolapse of the uterus and the downward, as well as the backward, displacement corrected.

5. Retroversion in itself is an infrequent cause of sterility.

6. Retroversion may cause miscarriage if the uterus becomes incarcerated, but most retroversions are corrected spontaneously during the early months of pregnancy.

7. A retroverted uterus discovered on post-partum examination, if obviously congenital, needs no treatment. If of the acquired type, it should be corrected and treatment by pessary instituted, deferring operation, if possible, until the patient has passed the childbearing period.

HARVEY B. MATTHEWS.

King, E. L.: Complete vs. Incomplete Hysterectomy. *N. Orl. M. & S. J.*, 1917, lxix, 820.

Granted that the operator is sufficiently skilled in pelvic surgery, complete hysterectomy is indicated (1) in fibroid cases where the cervix is badly lacerated or infiltrated; (2) in easy fibroid cases, with no complications, in which the complete operation will add very little to the duration or danger of the procedure; (3) in the severer types of pelvic infection, especially Neisserian, with a badly infected cervix; (4) in some cases where drainage is desired, when the vagina can be left partly or completely open for this purpose. But it is not advisable when the condition of the patient is poor or the local lesion is such that the removal of the cervix would present technical difficulties that would outweigh the advantages to be gained. A live patient with a cervix is better than a dead patient without one.

EDWARD L. CORNELL.

MISCELLANEOUS

Caturani, M.: Hydatidiform Mole and Chorio-epithelioma. *Am. J. Obst.*, N. Y., 1917, lxxv, 591.

The author reaches the following conclusions from his study:

1. We cannot accept as absolutely correct the plan of unification of Nathan Larrier and Brindeau, which makes of hydatidiform mole the first stage, not necessarily followed by the second, chorio-epithelioma, on the belief of the common anatomical and physiological behavior of the elements in both conditions. But the more we find reproduced in hydatidiform mole the features of the primitive chorion (vacuolated syncytium, Langhans' cells in active mitosis, comparative disappearance of the connective-tissue core of the villus), the proliferation assumes a very suspicious significance.

2. The real evidence of the malignant tendencies of hydatidiform mole can be obtained by a close observation of its relation with the maternal structures.

3. The invasive mole deserves to be credited as a form of passage to chorio-epithelioma. Most of them are real transitional forms, and the best name to be given to them is "chorio-adenoma malignum."

4. The core of the villus is not to be considered as a factor of exclusion in the diagnosis of chorio-epithelioma.

5. The reduction of the classification of Marchand to two types, syncytioma and chorio-epithelioma, finds an almost uniform support in the studies of the statistics, as it seems to exactly correspond to the anatomical constitution of chorionic tumors, and has a decided prognostic significance.

C. H. DAVIS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Permar, H. H.: An Analysis of the Vaginal Flora in Late Pregnancy. *Am. J. Obst.*, 1917, lxxv, 652.

The author reports that in the 130 cases studied there were no growths in 12 of the cultures. Of the 12, all but one had shown various bacteria in direct smear. In these smears, various Gram positive bacilli, mainly the large square end form, were found in 9 instances. Beside the one showing no organisms in smears and no growth, one showed Gram positive diplococci, and one Gram negative bacilli. From the remaining 118 cases Gram positive cocci, including many varieties, were grown 117 times. Gram negative cocci were found but once. Gram positive bacilli were grown 9 times, and Gram negative bacilli 17 times. Blastomyces were grown 9 times, an anaerobic streptothrix once and a member of the nocardia group once.

The presence in the vagina of streptococci giving the carbohydrate reactions of virulent organisms, as well as those of less virulent character but corresponding to the forms recognized in the other cavities, in which virulent or apparently virulent organisms are constantly present without giving rise to disease symptoms.

C. H. DAVIS.

LABOR AND ITS COMPLICATIONS

Wertenbaker, W.: Spontaneous Rupture of Uterus Following Administration of Pituitary Solution. *J. Am. M. Ass.*, 1917, lxxviii, 1895.

Within twelve weeks of each other there have been admitted to the obstetric ward of the Delaware Hospital two patients with spontaneous rupture of the uterus, following the administration of a single dose of pituitary solution. These would seem worthy of more than passing interest since the widespread advocacy of the use of this agent.

These two cases bear a marked resemblance to each other in their salient features: In neither was there any intra-uterine manipulation, attempted version, or use of forceps. In neither case had true engagement taken place, but the presenting part was well within the pelvic brim, and otherwise they met the usual indications for the use of pituitary solution. Both patients were multiparæ; in both dilatation of the cervix was complete, the membranes ruptured, the foetus presenting by the vertex, with the uterine contractions weak and inefficient. Each patient received only a single injection of one ampoule (1 ccm.). Routing pelvimetry was not carried out, but both pelves were practically normal and the conjugata vera, as estimated at operation, at least 10 cm. in each.

After operation both babies were found to be somewhat above the average size, one weighing a little above and the other a little below 4,500 gm.—9.9 pounds. One patient died, the other recovered.

EDWARD L. CORNELL.

PUERPERIUM AND ITS COMPLICATIONS

Montgomery, E. E.: The Conservative Treatment of Puerperal Sepsis. *Penn. M. J.*, 1917, xx, 465.

Montgomery, in speaking of the conservative treatment of puerperal sepsis, says: "No one will now dispute the assertion that the most effective treatment, and consequently one worthy of first consideration in the conservative management of the puerperal woman, is prophylaxis." Prophylaxis is secured through the accurate preparation of patient, environment, and attendants.

The author discusses the term conservative from two standpoints: (1) as opposed to radical measures, and (2) that, wherever possible, preservation of function as well as life should be the ultimate goal.

Operative measures, as a rule, have no place in the treatment of puerperal sepsis. Rest, food, elimination, fresh air and sunshine, the establishment of early immunity, and, when needed, supportive therapeutics is the safest plan in the majority of cases. For establishing early immunity, when indeed this seems necessary, the author recommends the utilization of serums and vaccines.

Surgery has a place in the management of certain cases of puerperal sepsis, but should be employed with sober circumspection. Evacuation of pus collections is often of the greatest value and should be boldly attacked when frankly present. Sacrifice of important structures should never be made unnecessarily, but if such sacrifice will surely give relief and conserve life and health, radical measures become conservative.

HARVEY B. MATTHEWS.

Bandler, S. W.: Theories Concerning Pregnancy, Labor, and the Placental Gland. *N. Y. M. J.*, 1917, cv, 865.

The author has tried the following procedure to avoid the use of the Barnes bag: At 7 a.m. an ounce and a half of castor oil was administered, and three hours later at half-hour intervals ten grains of quinine. One or two hours after the last dose of quinine, two to five minims of pituitrin were given every half hour for several hours. This method was effectual in many instances in bringing on regular rhythmical labor pains and sending the patient into a normal labor. This procedure was found to be perfectly reliable in over 80 per cent of

multigravidæ when tried within a week or ten days of the expected labor period. In 50 per cent of primigravidæ it is effectual at or about the time at which labor is expected. If this method is tried from two to three weeks before the expected time, the effect is by no means so good and, in many cases, has no result at all.

The ovary nourishes the uterus, making it grow, but causes regular bleeding. The placenta nourishes the uterus, making it grow, but stops bleeding. If the corpus luteum acts on the hypophyseal posterior lobe and makes it overact at menstruation, we often observe menstrual pain simulating that of labor, and called dysmenorrhœa. Corpus luteum and the posterior pituitary lobe act together in menstruation. The placental secretion inhibits the posterior lobe as well as the corpus luteum and no menstruation takes place, only painless contractions.

With an ovum full of atresic follicles and corpus luteum rests ovulation is often inhibited, but the stimulation to the posterior lobe is present, coagulation takes place slowly or quickly and diminished or excessive menstruation occurs, but no ovulation.

It would be wise to try the effect of placental secretion on dysmenorrhœa, because of this theoretical inhibition by its action on posterior hypophysis either directly or through the corpus luteum. If placental extract stimulates the anterior lobe of the hypophysis, it might be advisable to use this extract in cases where it is desired to stimulate growth in children, with the administration of hypophysis extract also.

If placental extract stimulates the corpus luteum to added growth and if the corpus luteum is of such nutritional advantage to the uterus and its lining, placental extract might be given to stimulate the ovaries to added function. Then we might give placental extract plus corpus luteum extract in cases of infantile uterus to aid in its development. If the corpus luteum rouses the posterior lobe of the hypophysis, causing menstrual pain, then corpus luteum is not indicated in all dysmenorrhœas.

If placental extract inhibits the posterior lobe of the hypophysis and holds its contractile powers in abeyance for months, then it might be wise to give placental extract for dysmenorrhœa. If corpus luteum stimulates the uterus and its lining, causing diapedesis and rhexis, and if placental extract results in growth of the uterus but overcomes diapedesis and rhexis, placental extract should be given in cases where excessive menstruation is due to hyperovarianism. Thus the function of the ovary and pituitary as nutritional factors of the uterus may be dissociated from their function in causing menstrual bleeding. One must think of the placenta as an organ which directly or through its effect on corpus luteum nourishes the uterus and its lining, but overcomes its tendency to bleed.

Therefore, even if ovarin is contra-indicated in menorrhagia, this may be overcome by placental

extract. If the decidua stimulates the corpus luteum and this stimulation is lost by menstruation, then placental extract, by inhibiting menstruation, allows the retained decidual secretion to continue its stimulation of the corpus luteum. If we knew just what elements of the decidua, or the ovary, or the corpus luteum, or the pituitary were responsible for the capillary dilatation and increased tension resulting in rhexis and diapedesis, we would find them antagonized by some placental ferment or hormones.

To conclude these theoretical considerations, some of which are being proved true, it may be stated that labor represents a crisis in the relation between the glands of internal secretion, particularly the ovary, the placenta, and the hypophysis. On the two hundred and eightieth day a magnified menstruation takes place. Placental inhibition is overcome, the ovaries, so to speak, come into their own, and the posterior pituitary gland exhibits an action whose character is exemplified and intensified by the pituitary extract which is used in obstetrics. If placental hormones antagonize or inhibit the menstrual action of corpus luteum and pituitary, it is probable that in many cases this inhibition is ineffectual. If this be so, this lack of power in the placental hormones may explain repeated abortions (Wassermann negative) occurring at menstrual intervals. This explains the well-known liability to abortion at periods four, eight, twelve, etc., weeks after the first missed menstruation. It also explains the tendency to go ten or more days "over the period" with a then ensuing menstruation. These occasional occurrences in women must and may be viewed as early expulsions of an imbedded ovum whose trophoblast secretion has not inhibited the menstrual stimulus of decidua, ovary, and pituitary.

EDWARD L. CORNELL.

Hymanson, A., and Hertz, J. J.: Microbic Flora in the Parturient Vagina and the Mouth and Rectum of the Newly Born; Remarks on Sepsis Neonatorum. *Am. J. Obst.*, N. Y., 1917, lxxv, 662.

The authors report their cultural results in 42 cases studied. The cultures were positive in 16 and negative in 26 cases. In but 4 cases were the same organisms found in the maternal passages and the baby's mouth and rectum—staphylococcus 3, streptococcus 1. In the other 6 positive cases the results were not uniform.

The authors believe that their findings are not incompatible with those of the recent German and French research, and in some essential respects show close agreement, such as predominance of negative results on the first day of life, which is probable evidence of infection of the infant's mouth from the mother's vagina before the second day. There was also constant predominance of staphylococci over streptococci, the former being the first to appear.

C. H. DAVIS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Hyman, A.: Difficulties in the Interpretation of X-Ray Shadows, in the Kidney and Ureteral Region. *Med. & Surg.*, 1917, i, 343.

By an analysis of three cases Hyman illustrates the difficulties that may arise in the interpretation of shadows in the kidney and ureteral region on X-ray examination.

The first case showed recurring attacks of typical renal colic with costovertebral tenderness and red blood-cells in the urine. There were three distinct shadows within the kidney outline. At operation no stones were found and subsequent history proved the attacks of colic to be due to a twisting of the pedicle of the ovary. The shadows in the radiogram were then attributed to calcified mesenteric glands.

The second case showed a triangular shadow within the kidney outline which was interpreted as stone. Clinical findings of dull pain in the back and costovertebral tenderness, together with the cystoscopic findings of a hydronephrosis supported the diagnosis of renal calculus. At operation an infected hydronephrosis was found but no stone. The shadow was attributed to a retroperitoneal gland which was distinctly palpated at the time of operation.

The third case was operated upon with the diagnosis of multiple calculi and pyelonephritis, which was made from the history of pain in the left lumbar region and the presence of three shadows in the kidney area. At operation it was shown that the shadows were cast by a mass of calcareous retroperitoneal glands.

In conclusion, the author emphasizes the importance of confirmatory examinations such as stereoscopyelography and particularly wax-tipped catheterization. These examinations were not carried out in the above three cases. Roentgenographic findings, negative or positive, alone should not be relied upon in the diagnosis of renal or ureteral calculi.

FRANK HINMAN.

Dillingham, L. S.: A Report of Fifty Cases of Tuberculosis of the Kidney and Bladder Clinically Cured Without Operation. *Calif. St. J. Med.*, 1917, xv, 70.

In the author's opinion cases of tuberculosis of the kidney should be treated with very small doses of tuberculin, averaging 1/75000 mg. twice weekly. Sometimes this dose is considered too large and he gives 1/750000 mg. The criterion as to the dose is that the patient should feel better immediately and this betterment lasts for from two to four days and then another dose should be administered.

This treatment in conjunction with hygienic and symptomatic treatment has been used in 50 cases, the duration of treatment being from 1 to 11 years, with an average of 3.5.

The author uses great care in the diagnosis and depends principally upon microscopic examination of the urinary sediment. He states that the urine should be centrifuged for at least one hour; or with the newer extra-high-speed motors for one half hour before results are reliable.

In conclusion he states that the tuberculous kidney should not be removed so long as it has some functional value. When this functional value has ceased entirely removal of the diseased mass is indicated.

V. D. LESPINASSE.

Avilés, I.: Capsular Fibrolipomata of the Fatty Capsule of the Right Kidney. *Bol. Asoc. méd. de Puerto Rico*, 1917, xiii, 66.

The author refers to the rarity of tumors of the fatty capsule of the kidney. He reports such a case in a woman 34 years old, who had been troubled with pain over the right upper quadrant and under the costal margin with nausea, vomiting, and loss of appetite. A mass was palpated on the right side like a liver tumor. Detailed examination suggested a tumor of the right kidney with calculi. On operation a retroperitoneal tumor, about the size of a child's head, was found. This corresponded to the fatty capsule of the right kidney and involved the kidney pelvis. The patient made an uneventful recovery. The tumor was of globular shape, of firm consistence, and weighed about four pounds. It was encapsulated, the surface being smooth. A calculus, conical in shape, and about the size of a lemon, was found in the kidney pelvis. On section the kidney was somewhat abnormal. Microscopically the tumor was a fibrolipoma. Six months after operation the condition of the patient was quite normal.

The author remarks that the case shows very clearly what Adami says: "Tumors of long growing duration to one side, with no impairment of the general health, most often originate in the fatty capsule of the kidney."

W. A. BRENNAN.

Barnsby, H.: Gunshot Wounds of the Kidneys; Indications and Contra-Indications for Nephrectomy (Plaies du rein par projectiles de guerre. Indications et contra-indications de la néphrectomie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 971.

Barnsby reports a series of five isolated kidney wounds which he divides clinically into three categories: (1) immediate, abundant, primary hæma-

turia without other symptoms; (2) repeated hæmaturia; (3) primary issue of urine (traumatic fistula).

From his study of these cases the author believes that great conservatism is possible in isolated kidney injuries. If there is primary hæmaturia only and slight hæmaturia and the general condition is good, expectant treatment should be adopted as most frequently the recovery is spontaneous. If the hæmaturia is severe and the general state good intervention is indicated. Nephrectomy is indicated only when the kidney is ruptured. Partial lesions of the parenchyma may be treated conservatively.

If there is repeated hæmaturia it will most frequently be found to be due to a piece of projectile embedded in the parenchyma. This should be removed with the least possible amount of traumatism, but the organ should be preserved.

If there is a flow of urine, a traumatic fistula, it is a symptom of a deep serious lesion. Although there are cases in which nephrectomy is unavoidable yet this should not be too quickly resorted to. The kidney may be opened, drained, and curetted, one or more times, and the radical operation done only when these attempts at preservation fail.

W. A. BRENNAN.

Caulk, J. R.: Preliminary Renal Drainage with Special Reference to the Two-Stage Operation on the Kidney. *Ann. Surg., Phila.*, 1917, lxxv, 593.

Caulk states that while the importance of preliminary drainage, by catheter or open operation, in prostatic surgery has been generally recognized and widely adopted, its value in the case of the diseased kidney before any direct surgical attack is made has been dealt with very sparingly by the general profession and its importance has not been sufficiently emphasized. According to this author there is a close parallelism between the preliminary treatment of certain renal retentions and infections previous to ultimate surgical attack on the kidney itself and of obstruction of the lower tract causing somewhat similar renal involvements.

Two methods of securing preliminary drainage of the kidney, ureteral catheterization and the two-stage operation on the kidney, are then briefly discussed.

The ureteral catheter may be effectively employed in cases of unilateral infected hydronephrosis. Drainage of these cases, either by repeated catheterization or by an indwelling ureteral catheter, will improve the patient's general conditions, relieve the other kidney of its strain, and restore its function to normal. Acute unilateral pyonephrosis is another condition in which catheter drainage is indicated, and is often followed by surprisingly good results. Furthermore, the ureteral catheter is extremely serviceable in cases of bilateral calculous pyonephrosis where the combined function is extremely low and the patients are uræmic from profound absorption. Repeated drainage and lav-

age in such cases may be followed by such improvement as to justify a two-stage operation upon the kidneys.

The two-stage operation upon the kidney is employed in certain very few ill individuals with either unilateral or bilateral involvement. It is seldom necessary to do a secondary nephrectomy in adults. The two-stage operation is often of great value in children and infants coming to the hospital with large pyonephroses, extremely toxic, with a high leucocytosis, and high fever, who look as though they would not survive any surgical attack. In bilateral calculous pyonephrosis or pyelonephritis this procedure is of the greatest value. With each kidney filled with a large coral stone, with the cortex badly damaged, with retention of varying degrees, and an extremely low combined function, the removal of both or even one stone will be more than the patient can stand. The author believes from his own experience that the two-stage operation on each kidney should be more frequently used in this type of case.

H. A. FOWLER.

Colp, R.: Effect of Anæsthesia and Operation on Kidney Function as Shown by the Phenolsulphonephthalein Test and Urinary Analysis. *Am. J. Med. Sc.*, 1917, cliii, 868.

Fifty-five cases operated upon by the second surgical division of the Presbyterian Hospital were studied by Colp to determine the effect of anæsthesia and operation upon kidney function. Phenolsulphonephthalein and urinary analysis were the tests used. In the series there were 22 cases of hernia, 11 cases of chronic appendicitis, 6 cases of gynecological surgery, and the others miscellaneous. Ether was used in 47 cases, nitrous-oxide oxygen in 7, novocaine, one per cent, in one. It was found that the average case showed very little change in kidney function, 36 hours postoperative. In 25 per cent of the cases there were slight urinary changes, which had cleared up in ten days.

The author concludes that for a long anæsthesia, and apparently for nervous patients gas and oxygen anæsthesia seems to have the least irritating effect on kidney function.

FRANK HINMAN.

Macht, D. I.: The Pharmacology of the Ureter; Action of Nitrates and Nitrites. *J. Pharmacol. & Exp. Therap.*, 1917, ix, 427.

Macht has studied the pharmacological action of nitrates and nitrites upon the ureter. The isolated ureter was suspended in normal Locke's solution in which a part, or the whole, of the NaCl was replaced by its equimolecular weight of sodium nitrite or nitrate. The effects of the nitrate and nitrite ions on the ureter are very different. The nitrate effect is slightly stimulating and is not toxic. The nitrite effect on the other hand is toxic and paralyzes the ureteral preparations without completely relaxing them. The ureter is killed and remains in a moderately contracted condition. Such an effect

is not a desirable one and if the same conditions hold clinically the value of nitrites in counteracting ureteral spasms is nil. A search through the clinical literature by the author has failed to reveal any cases of renal colic successfully treated by the use of nitrites.

FRANK HINMAN.

BLADDER, URETHRA, AND PENIS

Rico, I.: Some Considerations Concerning the Diagnosis and Treatment of Gunshot Wounds of the Bladder (Algunas consideraciones acerca del diagnostico y tratamiento de las heridas de bala por la vejiga). *Repert. de med. y cirug.*, Bogota, 1917, viii, 200.

Rico classifies the diagnostic signs of an endovesical projectile as: (1) the point of entry of projectile; (2) immediate total hæmaturia, and persisting in a less degree for three or four days; (3) cystitis and its accessory symptoms; (4) urine retention; (5) metallic exploration with Guyon's explorer; (6) bimanual palpation; (7) radiography; (8) cystoscopy. No single sign suffices and not every bullet in the vesical field which appears movable on radiography is necessarily in the bladder unless other probable evidence of an intravesical foreign body is present.

If a positive diagnosis is made the method of extraction depends on the kind of projectile. Small arm bullets which are smooth and regular in form can be extracted by the natural route using Legueu's lithotripter. Uretrovesical anæsthesia suffices; at times a complementary meatotomy at the moment of extraction is necessary. This avoids sectioning the bladder, an operation of gravity and necessitating a long convalescence. In the case of larger projectiles or those of irregular form, or when covered with calculous formations, in fact whenever its diameters are not conformable to the caliber of the urethra suprapubic incision is indicated.

W. A. BRENNAN.

Barringer, B. S.: Radium in the Treatment of Carcinoma of the Bladder and Prostate; Review of One Year's Work. *J. Am. M. Ass.*, 1917, lxviii, 1227.

Radium treatment has caused the reduction or disappearance of carcinomatous nodules of the prostate with surprising regularity. Striking results have been obtained both in early and advanced cases. The early cases, those in which the carcinoma is fairly well confined to the prostate and in which there is little or no perivesicular infiltration, all show a shrinkage of the carcinoma.

The reduction which occurs in carcinomatous lobes is, as far as has been observed, permanent. One case has been followed ten months; two for six months; and more recent cases but one or two months after the reduction.

The symptoms in those cases in which the carcinoma has been reduced generally show striking improvement. This symptomatic improvement is

evidenced by increase in weight and strength, decrease in frequency of urination, and the return of or improvement in erections.

There has been no departure from the technique used in the first case of one year ago. Different strengths of radium have been used, but the application is the same. The radium is placed in the end of a needle extending from the tip from 1 to 1.5 inches along the shaft. These needles are from 4 to 6 inches long, and are inserted through the perineum into the prostate or further into the perivesicular sheath. Anæsthetization of the perineum and the prostate with 0.5 per cent novocaine and epinephrin makes the insertion of these needles practically painless. Little or no pain is felt during the presence of the needle (about twelve hours), and the patient can either urinate or be catheterized. This means at most but twenty-four hours in the hospital.

The radium so used is practically unscreened, but the maximum effect of the radium takes place directly in the center of the carcinomatous nodule.

The patient usually has pain in the prostate and urinary frequency, beginning about three days after irradiation, and lasting a number of days. In some of the cases in which large doses were used, the reaction has been severe and has lasted several weeks; therefore, the author believes that lesser doses are about as effective and not so painful. Nearly all of these patients have been irradiated only once in two or three months and no second treatment is given until the effect of the first is entirely gone.

The primary effect of the radium may be to increase the amount of the residual urine. The ultimate effect of the radium application on residual urine is probably nil, the amount neither increasing nor decreasing. Hence those patients who have chronic retention of urine require either the catheter or operation in addition to irradiation. It would seem wiser not to operate until the carcinomatous prostate had at least been given one dose of radium.

No sloughs have resulted from the radium needles.

Radium apparently has a selective action on carcinoma. The author concludes this from descriptions by Ewing of carcinomata examined after radium treatment, and from his own experience.

He has used radium on a hypertrophied prostate with absolutely no effect, neither burning nor shrinkage occurring; yet the same amount of radium would markedly reduce a carcinomatous lobe. A similar result was experienced in a case of chronic contractive fibrosis of the corpora cavernosa, barring the fact that the radium caused a superficial burn of the penis.

The pathologic examination of a prostate removed five months after irradiation is of interest. The prostate was removed because of retention of urine. Only one treatment was given this patient because he was old and very feeble. The prostate had been considerably reduced in size following the

radium treatment. At operation the prostate shelled out like a non-malignant adenoma. Ewing's report is as follows:

"Material consists of several lobulated opaque portions of prostate making a mass as large as a hen's egg. Much of this has the honeycomb appearance of chronic prostatitis, but some areas are very firm and solid. Two such areas, the size of a bean, were sectioned. The main tissue of the gland shows lesions of chronic prostatitis with dilated glands and feeble epithelial proliferation. The solid areas show fibers of muscle tissue separated by rows of small epithelial cells with hyperchromatic nuclei. The appearance is that of diffuse carcinoma in a state of fibrosis. One area of adenocarcinoma is found in the center of a fibrosed area. There is no necrosis.

"In view of the history the diagnosis may be made of carcinoma, diffuse and adenomatous following prostatitis, and undergoing atrophy and fibrosis from radium."

Clinically all of the cases treated are of about the same degree of malignancy. There is a class of cases of prostate carcinoma, however, of marked malignancy. In these the primary focus in the prostate is often overlooked, and the patient comes to be treated for his secondary focus. There have been two such cases.

Very large carcinomata accompanied by cachexia and loss of weight on the part of the patient are beyond radium and any other treatment.

The first year's work has not revealed what, if any, cases have been cured. Time alone will answer that question.

I. S. KOLL.

Ashcraft, L. T.: The End-Results of Fulguration in Cases of Papillomata and Other Tumors of the Urinary Bladder. *J. Am. Inst. Homœop.*, 1917, ix, 1036.

The report is based on personal experiences with 19 cases of papillomata and 20 cases of carcinoma observed over varying periods, from a few months to three years.

Of the cases of papillomata, all but two were completely cured. One of these was greatly improved, the other declined treatment. Of the carcinomatous patients 12 died of sepsis, 4 following palliative operation, and 8 unoperated owing to their hopeless condition, or refusal on the part of the patient to undergo operation. Four of five patients known to be alive are still under observation. The procedure followed in these cases was temporary relief by surgical resection and cauterization, to which was added fulguration in three cases. The author discusses the merits of the various procedures suggested, surgery (methods of Squier, Watson, Fenwick, etc.), the use of radium, and fulguration.

The value of radium is still sub judice, different authors obtaining absolutely different results. Barry's experience is the most promising; he reports the complete disappearance of 2 carcinomata out of 9 treated. Most authors prefer fulguration. The

author himself prefers surgical extirpation which may be followed by fulguration for recurrences.

In discussing the technique of fulguration the author describes his method of insulating the patient by an asbestos mat, and his manner of applying the current. One pole is made of a metal plate applied to the body as near as possible to the area treated; the other pole is the copper wire directed to the seat of the disease through an appropriate cystoscope. The author has shown that for equal amperage greater tissue destruction occurs when this wire is embedded into the tissues for a millimeter or two and that with an amperage of 750 ma. wide tissue destruction outside of an area which it is desired to include may take place. He therefore establishes 500 ma. as the maximum amperage and begins at 250, applying the same for fifteen seconds with a rest of fifteen seconds. He next increases the amperage, remembering that the pain sensation is reached at lower amperage levels in some patients than in others, as many can not stand the full amperage of 500. Six applications of fifteen seconds each are made with intermissions. Opportunity to obtain pieces of loosened tissue should not be neglected.

The disagreeable after-effects are pain and reaction. Pain in papillomatous cases is slight and transient and easily controlled by anodynes. Reactions in the same type of cases are mild and transient but in carcinomatous cases are apt to be severe and violent. For this reason surgery seems better suited, fulguration being reserved for recurrences. One case of carcinoma so treated now shows only patches resembling leucoplacia. The author warns not to omit the Wassermann test. In conclusion he points out that successful end-results depend on early diagnosis, as all of the methods employed are more potent by far in the early stage.

L. L. TEN BROECK.

Goullioud: Traumatic Intraperitoneal Rupture of the Bladder Followed by Recovery (Rupture traumatique intra-péritoneale de la vessie suivie de guérison). *Lyon méd.*, 1917, cxxvi, 177.

Goullioud reports a case of traumatic intraperitoneal rupture of the bladder in a woman of 33 years who was knocked down and run over by an automobile. The bladder rent was vertical, 4 to 5 cm. in length, anteroposterior, and situated on the vesical dome toward its posterior face. This is the habitual location of such ruptures. There was concomitant pelvic fracture. The bladder was full at the time of the accident. The bladder lesion was only found during an exploratory laparotomy and a quantity of serosanguineous fluid found in the peritoneal cavity was evidently the escaped urine. The bladder was sutured in three planes and a Sim's sound left in it. A radiograph made three weeks later showed a fracture of the horizontal ramus of the pubis and a fracture of the descending ramus. After two months the patient became convalescent.

W. A. BRENNAN.

Caucci, A.: Experimental Contribution to Vesical Plastics with Free Fascia Lata Strips (Contributo sperimentale alle plastiche vesicali con lembi aponeurotici liberi). *Clin. chir.*, Milano, 1917, xxiv, 1459.

During 1912 and 1913, in the laboratory of special surgical pathology of the University of Rome, Caucci made an experimental investigation of bladder plastics with free fascia lata strips. The scope of the experiments was to determine: (1) if the aponeurosis is a plastic material adapted for the repair of losses of bladder substance; (2) within what limits and with what mechanism the aponeurosis can effect such an office; (3) the practical applications.

The experiments were made on medium-sized dogs of the female sex and the grafts were taken from the neighborhood of the thigh.

The results obtained by Caucci were as follows:

1. Fascia lata is a good plastic material to repair losses of substance of the bladder wall which do not involve the mucosa. In losses of substance involving the entire thickness the fate of the transplant is frequently compromised by contact with the urine. When the transplant is protected from urinary contact in losses of substance involving the whole thickness, the principal cause of failure is eliminated and the excellence of the plastic material is shown not only in closure of the breach, but in favoring the anatomic restoration of the bladder wall.

2. It is the rule that the graft takes when the loss of substance involves the musculature only or when the continuity of the mucosa is established by a plastic method; the graft takes less frequently if employed to repair complete breaches. In such cases the conditions favoring taking of the graft are: (1) scrupulous accuracy of technique; (2) relative asepticity of the urine; (3) the extent of the strip. The maximum dimensions compatible with the author's experiments are 3.5 by 3.5 cm.

3. Histologic examination shows that between the vesical walls and the graft a process analogous to cicatrization by first intention is observed. A fibrinous edge cements the graft to the margins of the breach and in these margins there is a dilatation of the blood-vessels and a leucocytic diapedesis followed by a neoproduction of round elements which emigrate into the margins of the graft insinuating themselves between the fibers with a centripetal direction. At the same time from the edges of the bladder mucosa a newly formed epithelial ring distends over the internal surface of the graft and covers it completely in a few days. By the fourth week this new formed epithelium has the characters of adult vesical epithelium. The fascia lata gradually becomes substituted by connective tissue which undergoes the customary evolution of cicatricial tissue, is partly absorbed and partly transformed into fibrous tissue. When the involution of the cicatricial tissue has reached its term, continuity of the mucous and submucous coats is reestablished and the function of the aponeurosis seems therefore to be to

temporarily close the breach while the walls are not regenerated and reintegrated in all their layers.

4. The method of plastic repair of loss of substance of all coats of the bladder with a free fascia lata strip has already passed the experimental stage; Schmidt has used it in the treatment of vesicovaginal fistula. However, the practical application has limits since it is not advisable to employ the method for extensive breaches. It finds its application in cases of partial loss of substance of the walls not involving the mucosa, such as are observed following extirpation of extravascular tumors, or the detaching of intestinal loops adhering to the bladder. The graft of a strip of fascia lata over a vesical suture will be a useful accessory procedure, having for its end the strengthening of weak points in the walls.

W. A. BRENNAN.

Rochet and Richer: Some Cases of Penile Restoration After War Injuries (Quelques cas de restauration pénienne après traumatismes de guerre). *Lyon chir.*, 1917, xiv, 63.

The authors give the clinical histories of four complete or almost complete sections of the penis including the urethra following war injuries in which they have restored the penis and the divided urethra. In two of the cases the section of the penis was complete; in the other two it was incomplete. The restorative technique is as follows:

1. A minute dissection and liberation of the two pieces and their surfaces. The peripheral part may be found some distance from its origin; thus it was found in one case transplanted to a large wound of the triangle of Scarpa. The central part of the penis may be displaced too and found in a corner of the preputial wound. The pieces must be perfectly isolated and mobilized.

2. The two corresponding surfaces are dissected so as to leave them absolutely even and horizontal. Scar tissue is resected in order to escape angulations.

3. The fibrous coats of the cavernous bodies are united by a semicircular row of catgut sutures. Then the deep semicircular layers of the urethra are united by three or four sutures and the superficial semicircular layer by three to four fine silk threads.

4. Covering the rough bleeding surfaces by skin which fortunately is easily available in the prepuce and in the scrotum.

In two of the cases treated by the authors recourse was had to a temporary deviation of the urine by means of a perineal fistula of the urethra.

The results were satisfactory in all the four cases; but the time has not been sufficiently long since operation to pronounce a definite opinion. One case dates back sixteen months; the others are more recent. The functional results are quite satisfactory up to the present time. In three of the cases it is stated that erections are normal. Blood circulation is effected throughout the organ. The intermediate cicatrix of the two ends does not offer any hindrance to the circulation.

The authors have been able to find in the literature only three cases of sections of the penis approximating the cases now reported. W. A. BRENNAN.

Esteves, J. A., and Chiappori, R.: Prolonged Priapism. *Prensa méd. argent.*, 1917, iii, 341.

The authors report a case of priapism which they believe to be of the rare idiopathic variety.

They believe that the treatment of prolonged priapism should be surgical and that the intervention should be made within the first twenty-four hours. Within this period which should be shortened if possible, suspension by means of a bandage when the organ is voluminous should be tried. This obviates operative intervention if successful.

Intervention should be commenced by deep general anæsthesia; if the erection persists in spite of it the operative procedure is begun. All surgeons are agreed in using a small lateral incision of the cavernous body longitudinally in the middle of the member. Incision on one side usually suffices, but to facilitate expression of blood bilateral incisions are customary. Some have prepared to act at the root of the cavernous body by incising the perineum but the authors do not believe there is any advantage in this. For the lateral incisions they think that punctures may sometimes be substituted; they are made with a large trocar. This proceeding is especially beneficial as a postoperative measure but it appears to the authors that the great inconvenience which punctures offer as the sole treatment is the lessened facility to blood flow W. A. BRENNAN.

GENITAL ORGANS

Lerda, G.: The Operative Treatment of Varicocele (Contribution au traitement opératoire du varicocele). *Presse méd.*, 1917, p. 284.

Lerda says that there are four types of patients who come to the surgeon with varicocele symptoms:

1. Nervous patients whose objective lesions are scarcely in accord with the troubles complained of, these being especially neurotrophic, and vasomotor disturbances of the genital sphere.

2. Asthenic patients with poorly developed musculature, long and flaccid scrotum, weak cremasteric reflex, and marked dilatation of the veins of the spermatic cord.

3. Plethoric individuals with precocious angiosclerosis with large packets of little veins about the testicles.

4. Patients who besides the venous lesions show more or less weakness of the inguinal walls or even a slight amount of hernia.

The indications for the operative treatment should be studied case by case, not only according to the results of the objective and subjective examination, but according to the findings during the operation itself. The following rules should in general be observed:

In the less severe cases where nervous phenomena predominate and the scrotum is long and flaccid and there is no predisposition to hernia the indication is for conservative scrotoectomy with cord plication.

In all other cases intervention by the inguinal route, either adding a scrotoectomy or not according to the condition of the scrotal contents. In this intervention by the inguinal route preference should be given (1) to the Nahrat Nilson procedure in cases where severe angiosclerotic lesions with sensory lesions of the testicle and cremaster atrophy are found; (2) to the Carta-Mori procedure when there is phlebectasia and phlebosclerosis and the fibromuscular tunics appear very resistant; (3) to the Parona method, with the author's modifications, when the varicocele is accompanied by reactive spermatic cord or epididymic lesions.

The three procedures are described and fully illustrated. W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EAR

Auerbach, J.: Case of Labyrinthine Fistula with Complete Loss of Cochlear Function and Persistence of Normal Vestibular Function. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 117.

The case reported has the following interesting features:

1. The practically normal vestibular reaction, showing neither an increased nor a diminished static activity.

2. Complete loss of cochlear function, indicating a wide-spread invasion of the labyrinth in the past.

3. Question of treatment. This patient was seen by several otologists, who advised a radical mastoid operation. Was this advice justified in the light of the findings?

4. A dry ear with no spontaneous nystagmus, no dizziness, no loss of hearing seems to call for no operative interference.

5. With a recurrent acute infection of the middle ear causing retention, dizziness, spontaneous nystagmus, and disturbance of equilibrium, a radical mastoid would be in order. In no case should a labyrinth operation be considered, unless intercranial complications were threatened or manifest.

OTTO M. ROTT.

Clevenger, W. F.: Infections of the Mastoid; Skiagraphy and Other Aids to Early Diagnosis. *J. Indiana St. M. Ass.*, 1917, x, 140.

Recognizing the difficulties in making a diagnosis of the atypical cases of mastoiditis, which so frequently occur because of the variations in the anatomical conformities of the temporal bone, the author emphasizes the importance of availing oneself of all the aids possible, viz., investigation as to the nature of the infecting organism, the general resistance of the patient, blood examination, and X-ray plates.

Summarizing the factors to be kept constantly in mind, as essential in making an early diagnosis of mastoid disease, the author mentions:

1. Anatomic difference which produces a variety of objective and subjective signs.

2. Color and position of the drum membrane.

3. Color and character of the membrane covering the posterior bony canal wall over the antrum.

4. Character of the bacteria found in the discharge. (Discharge may at times be absent.)

5. Skiagraphic findings.

6. Three points of tenderness, namely, the antrum, tip, and vein. These are sometimes absent, due to thick cortex.

7. Ordinary tests for middle ear deafness.

8. Indefinite cranial pain with slight rise of temperature following history of acute middle ear inflammation with or without discharge. OTTO M. ROTT.

Stucky, J. A.: End-Results of 111 Radical Mastoid Operations. *South M. J.*, 1917, x, 511.

The questions considered are: (1) as to chronic discharge, (2) as to the hearing, and (3) as to the general condition of health.

In all the cases but 11 there was complete cessation of the discharge of pus. In these 11 cases there was occasional recurrence of discharge of mucopurulent material from the lower tympanic cavity, the result of a patent or patulous eustachian tube.

Nineteen cases reported a slight improvement in the hearing.

Sixty cases reported the hearing neither better nor worse.

Twenty-one cases were sure that the hearing in the operated ear was worse. All of these cases reported complete relief of all head symptoms and greatly improved health.

OTTO M. ROTT.

Wilson, J. G.: Further Report on the Effects of High Explosives on the Ear. *Brit. M. J.*, 1917, i, 578.

In a series of over 100 cases of injury to the internal ear from explosives, the chief symptoms were deafness and dizziness.

In another series of 200 cases, 50 had deafness, of which 17 showed signs of injury to the internal ear by the explosives; in the others the deafness was temporary and there was no dizziness. Of these 17 cases 7 had nerve deafness, without perforation of the membrana tympani; 10 had deafness with perforation; 6 had definite middle ear trouble previous to the concussion; 6 had recent perforation; 12 complained of vertigo.

The conclusions are as follows:

1. High explosives may produce perforation; two perforations occasionally are seen; small perforations are most frequently seen.

2. The perforation tends to spontaneous closure.

3. Concussion of the internal ear with nerve deafness and dizziness occurs with or without rupture.

4. The concussion may pass off leaving an injured nerve mechanism demonstrable by nerve deafness and dizziness.

5. The treatment of recent perforation aims at leaving the blood-clot over the perforation intact.

6. All cases should be kept in bed ten days.

7. An otologist of experience should be available at appropriate centers.

V. C. HUNT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

White, L. E.: Loss of Sight from Posterior Accessory Sinus Disease; Report of Three Cases. *Boston M. & S. J.*, 1917, clxxvi, 891.

From his 3 cases and 24 selected at random from the literature, the author sums up the results as follows:

There was complete recovery in 14; improvement in 7; total blindness in one or both eyes in 5; one death; 4 cases recovered without an operation; in 3 the sphenoid alone was opened, while the ethmoid was operated upon 10 times alone and 7 times in conjunction with the sphenoid. In 15 the onset was sudden, with a history of coryza in 12, and severe pain in 13. Pus was found in 22 cases and a thickened mucosa in 5. Scotomata and fundi changes were noted in 14. X-ray findings were helpful in 4 cases.

Cases of retrobulbar neuritis can be divided into the three following classes:

1. The acute ones which usually follow the grip or a coryza and are accompanied by severe pain. The pressure of the secretions in the sinuses and the swelling from the inflammation in the mucosa cause constriction of the optic nerve and artery.

2. The chronic ones where there is less pain, if any, and where an empyema of one or more sinuses is causing either a pressure on, or a toxæmia of, the nerve.

3. Those cases in which on opening the sinuses only a thickened mucosa is found. Here hyperplastic changes are taking place and a periostitis in the sinuses by extension through the optic canal becomes a perineuritis.

OTTO M. ROTT.

Graham, C.: Carcinoma of the Right Maxillary and Ethmoidal Sinuses, Seven Months After Operation by an Oblique Facial Route. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Laryngol.*, 59.

This patient complained of swelling of the right cheek, proptosis, and nasal obstruction, with blood-stained discharge. The right nasal fossa was filled by growth, which obscured the view beyond the vestibule. Microscopical examination showed "squamous carcinoma of a very malignant type."

After the removal of several carious teeth, operation was performed. An osteoplastic flap was turned over the cheek on the left side, the septum was removed completely behind the vestibular portion, and a complete view, with easy access, was obtained by which it was possible to remove the lateral mass of the ethmoid, the inner wall of the

maxillary sinus, the floor of the orbit to clear out the cavity of the maxillary sinus, to remove some growth adherent to the orbital periosteum interiorly, and to explore the sphenoidal sinus. The latter was not involved. The patient sat up in twenty hours, and was out of bed in forty hours, and left the hospital in twelve days after the operation, after an uneventful recovery.

OTTO M. ROTT.

Horne, W. J.: Specimen of Antrochoanal Polypus. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Laryngol.*, 65.

The patient, a woman aged 31 years, was sent to the hospital by her doctor on account of obstinate nasal catarrh of long duration. Anterior rhinoscopy disclosed material hypertrophy of the middle turbinal bodies, but no evidence of polypus or suppurative disease. Posterior rhinoscopy showed the postnasal space to be almost entirely occupied by a polypus which became directly obvious upon partly raising the soft palate. The polypus was removed through the mouth, and the anterior ends of the middle turbinal bodies reduced. After the removal of the polypus the left choana was found to be wider than the right; the polypus originated from the left antrum. Upon transillumination the left antrum was as translucent as, or even more so than, the right. In the circumstances, it was considered to be better to wait than to open the antrum.

OTTO M. ROTT.

THROAT

Moure, R. I.: Fifteen Cases of Total Laryngectomy (Sur quinze cas de laryngectomie totale). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 586.

During many years the mortality from the operation of total extirpation of the larynx was about 95 per cent. With better technique it gradually fell to 25 or 30 per cent. At the present time it is very much less in the hands of special operators. Moure now reports 15 cases operated upon by total laryngectomy; all bore the operation well and recovered. The end-results however have not been so favorable and in some cases there have been recurrences. The author thinks that the introduction of local anæsthesia for this operation is one of the most important factors in obtaining good results. In his own cases he performs tracheotomy fifteen days before the final operation. The operation whether performed from above downward or from below upward gives good results, each procedure having its own special indications. The author however prefers proceeding from below upward because it is simpler in execution especially after a preceding tracheotomy.

W. A. BRENNAN.

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SURGERY OF THE ABDOMEN

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SURGERY OF THE EXTREMITIES

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INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1917

COLLECTIVE REVIEW

LAVAGE OF THE RENAL PELVIS AND ALLIED THERAPEUTIC PROCEDURES IN THE TREATMENT OF PYOGENIC INFECTIONS OF THE KIDNEY

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I. HISTORY OF LAVAGE OF THE RENAL PELVIS

TWO years after the appearance of Pawlik's (94) communication on the possibility of catheterization of the ureters, Boze-mann (11) of New York in 1888 conceived the idea of washing the renal pelvis. It is true that he did not carry out the procedure through natural channels, as his first case had a fistula which involved the female urethra and gave access to the ureteric orifices, and in his second and subsequent cases he made a vesicovaginal incision in order to give access to them. Such a procedure naturally fell into disuse.

To Kelly (70) is due the credit of the first case of therapeutic renal lavage, and in this case he washed the pelvis no less than one hundred and twenty times. In spite of the laboriousness of such an outlook, the procedure was taken up by others and its establishment upon a firm basis merely awaited the development of the prism-cystoscope of Nitze, which was suitably modified by Casper (18) and Albarran (1), who reported the first case of pelvic lavage in males.

Since then reports have followed in rapid succession from Stockmann (114), Illyes 1900-1905 (61), and Alexandroff (5), and of especial interest were the independent reports of von Frisch (36) and Barth before the second German Urological Congress in 1909.

In the United States, Gross of San Francisco (46) in 1903 was the next after Kelly to report and he was followed in rapid succession by Ayres (8), Johnson of Boston (64), Bremmermann (13), and Garceau (40).

In France, Albarran reported observations on pelvic lavage before the Urological Congress in 1898, and at the same meeting Reynes reported the use of the ureteric retention catheter for the first time. Reports of Rafin (101) 1904, Imbert (62) 1905, Andre (6), and Souffrain (107) 1906, established the procedures upon a firm basis in France.

From this time on, the literature up to 1911 is that of sporadic case reports with the exception of three masterly French graduation theses, that of Souffrain of Nancy, 1907, that of Penel (95) of Lyons, and of most importance that of Perineau (96) of Paris, 1911. In addition to reporting a number of original observations, they collected all the cases that could be found in the literature, abstracted them and incorporated them in their reports.

In the following presentation it seemed best to take up the work where Perineau left off, and to collect and analyze the reports of the years 1911 to 1916 inclusive. However, all the literature was studied and incorporated in the bibliography.

II. THE RATIONALE OF THE THERAPY AND THE PATHOLOGICAL CONDITIONS OF THE KIDNEY, PYELON, AND URETER THAT WOULD THEORETICALLY BE AMENABLE TO THIS TREATMENT

It is difficult to discuss the pathology of pyelitis, a condition which has been known to recover in a great many cases spontaneously or after the ingestion of urinary antiseptics. On the other hand, it is no doubt true that many of the cases that do not recover in this manner go on to a more advanced stage of morbid change, usually pyonephrosis, and after nephrectomy the offending organ gives no idea of the pathology of the condition in which we are at present interested. At any rate it is sufficient to say that pyelitis is the condition which is theoretically and practically most amenable to the form of treatment under discussion. Here we have the signs of acute inflammation of a mucous membrane: congestion and exudation with resultant pyuria and at times hæmaturia, and œdema with resultant internal narrowing of the ureteric tube, especially at its anatomically narrow points,¹ and a consequent pelvic retention and dilatation of greater or less degree, usually under 50 ccm.

From a survey of the literature and in the light of certain personal experiences, it seems fairly certain that the mere passage of the ureteral catheter has often been sufficient to cause a sudden amelioration, within twelve to twenty-four hours, of the constitutional symptoms and if not a cessation, at least a diminution of the pyuria. This assertion is made on the basis of the record of a number of cures after one instrumentation accompanied by one pelvic lavage with any one of a dozen antiseptics, of a small personal experience, and on finding many reported cases that recovered quickly after diagnostic ureteral catheterization, whereas their authors attached no significance to the relation between the procedure and the result.

III. THE TECHNIQUE OF PELVIC LAVAGE

In performing lavage of the renal pelvis it is best to use a small catheter (preferably a No. 5 and certainly not larger than a No. 6) and to pass it if possible all the way into the renal pelvis.

¹ At this point it is in order to insist that a stricture is a permanent pathological entity, and when not congenital, consists in the narrowing of the lumen of a tube by scar tissue in its wall. The obstruction due to such a condition is not cured by a simple dilatation, recurs without subsequent treatment, and should be sharply differentiated from obstructive conditions due to swelling of the mucous membrane lining the tube. It is fair to insist on this, inasmuch as certain observers have reported these latter conditions as strictures and consequently have given the impression that stricture of the ureter is a much commoner condition than is probably the case.

I prefer to pass the catheter all the way, as I believe that I have noticed that the pain in pyelography is usually exaggerated if the eye of the catheter is in the lower ureter. Another advantage is that the reflux into the bladder is not interfered with. I employ preferably a 20-ccm. syringe with a blunted needle and irrigate the pelvis very gently, usually with 5 to 10 ccm. of solution at a time, allowing it to return before repeating the irrigation.

The solutions used by various authors are: boric acid 2 to 4 per cent, mercury oxycyanate 1 to 5,000, argyrol 5 to 25 per cent, protargol 1 per cent, aluminium acetate solution, perhydrol (Merck), collargol 5 to 15 per cent, and silver nitrate 1 to 1,000 up to as high as 1 to 5 per cent. It is an interesting thing to note that practically all observers obtain good results no matter what they use, so that it would seem that it really makes very little difference. Personally, I have preferred the stronger solutions of silver nitrate, usually 1 per cent, but I have increased this as high as 2.5 per cent. In using these strong solutions it is well to wait for the return of about as much as is instilled or a little more, in order to take account of the added urine excreted in this time, and to use saline in the bladder, as the sensation of the bladder to strong silver solutions is very much more acute than that of the pelvis and ureter. As a rule, the instillation of such strong silver solutions gives some soreness in the back, about as much as one ordinarily observes after collargol-pyelography, but the efficacy of such solutions is not to be denied. It is well, however, not to instill a great amount of strong silver nitrate into hydronephrotic sacs, or pelves in which there is doubt that it can be quickly recovered.

IV. INDICATIONS FOR THE THREE PROCEDURES

While it is true that a certain number of pyelitis recover with expectant treatment, it is also true that in pyelitis we have an inflammatory condition that is so contiguous to the essential parenchyma of the kidney that some claim that we are always dealing with pyelonephritides, i.e., that in all pyelitis there is more or less associated infection of renal tissue. It is not within the scope of this paper to enter upon the routes of infection of the kidney, of which there are now four pretty well established, or to decide which particular type of infected kidney is due to which particular route or mechanism of infection. Suffice it to say that, in my opinion, it is not rational to assume that very many

types of renal infection are amenable to this local method of therapy.¹

A. Rationally considered as a curative measure, it would seem that pelvic lavage is indicated in the following conditions:

1. *In acute pyelitis.* In this form it is striking how efficacious the procedure is. It is of course impossible to say how much involvement of the renal parenchyma occurs in a given case, but certainly a number seem to recover without perceptible renal damage, when catheterization (usually with lavage) is done, and this is no doubt due more to the re-establishment of drainage than to the sterilization of the infected mucous membrane. There is an idea current that catheterization of an acutely inflamed ureter and pelvis is dangerous, but I have not been able to convince myself that if it is properly done, it is associated with any but good effect.

From a diagnostic standpoint it is of course important to separate the cases of multiple septic infarcts, but this can be done as a rule by one experienced clinically. In passing it might be said that these cases are far more desperately ill than those of pyelitis and are not as a rule so commonly associated with repeated chills. Again, it is often striking how comfortable cases of acute pyelitis are between chills. Again, the pus-content of the urine obtained from the affected kidney is as a rule greater in cases of pyelitis.

2. *In chronic pyelitis.* Pelvic lavage is particularly effective in chronic cases not associated with distention of the pelvis. When the distention has advanced to such a degree that the smooth muscle is more or less parietic, the prognosis is of course not so good. The same may be said of the prognosis based on the history of a long duration of infection and pyuria.

Chronic bacterurias are at times puzzling as to etiology. Certainly some at least are due to mild chronic infections of the renal pelvis, or of a calyx, to which the local immunity is so great that very little cellular exudation and consequently little pyuria occurs. At any rate, it is an established fact, that after one or more pelvic

¹It has been asserted that good results have been obtained with pelvic lavage in cases of nephritis (Bright's disease). If so, it is illogical to assume, in the light of our present knowledge, that these results were anything more than accidental, since, even if this is an infectious disease, the pelvic mucous membrane has certainly given no evidence of its involvement (hence the lack of rationale in lavage) and the ureter has given no evidence of obstruction (hence the lack of rationale in catheterization).

It should be kept in mind that renal tenderness and fever, especially with acute exacerbations of nephritis, is not so rare as some of the older writers would have one believe. Such a case if insufficiently studied, could easily be considered one of mild pyelitis cured by a single catheterization of the ureters. It is on account of this, that in going over the literature for the material for the summary of 66 cases that follows, many cases have been omitted, chiefly because of the lack of bacteriological reports.

lavages, the urine may become pus-free but contain viable bacteria. That this condition of bacteruria is not to be regarded as unimportant is shown by the fact that such cases frequently relapse into pyuria and often into pyelitis and consequently sterile urine as well as a urine free of pus-cells is the therapeutic desideratum.

Finally it should be emphasized that one should not become so enthusiastic about a procedure that acts as promptly as pelvic lavage does when indicated, as to use it in cases where it can not possibly be of service, remembering that it is hardly of curative value where inflammation of the kidney has advanced so far as even early destruction of the renal parenchyma.

B. As an adjuvant procedure, and of secondary value, pelvic lavage is of service in mildly infected hydronephroses, especially where a plastic operation on the sac is contemplated. The same may be said in the case of stones in the renal pelvis with mild infection, where pyelotomy is contemplated. In these two instances the sterilization of the pelvic mucous membrane is of value preparatory to operation.

C. The rôle of the retention ureteral catheter is very limited. It is advocated and used by some in cases where there are apparently tight places in the ureter, notably situated just at the brim of the bony pelvis. It is also used in cases where lavage does not seem to produce good results, probably due to lack of drainage on account of turgescence of the mucous membrane. It has also been used where the pus in the pelvis is rather thick and does not easily run through the catheter; here, of course, repeated gentle lavages every six to twelve hours are indicated. It is also recommended in markedly neurasthenic subjects and in other cases where repeated cystoscopy is difficult, as in extremely irritable bladders.

Usually it is left in over night, allowing two lavages for each cystoscopy, but some observers have left them in place for weeks without apparent harm. Personally, I have never left a ureteral catheter in place for six to twelve hours, without such marked complaint that I was forced to remove it, and while I do not believe that the procedure should be condemned, in my opinion it should be employed as little as possible.

V. CONTRA-INDICATIONS TO PELVIC LAVAGE

As we have eliminated from this category acute pyelitic conditions which have been regarded by some as a contra-indication, the matter resolves itself into a question of diagnosis.

It is of course important that acute septic infarcts be not mistaken for pyelitis, but even so

if the patient's condition is not perilous, it is possible that, as the diagnostic limen between these two conditions is very narrow, one may do well to err on the side of conservatism, as there is reason to believe that some cases of unilateral septic infarct may recover without nephrectomy. In such cases, should the condition of the patient become progressively worse, suspicion should be aroused that lavage is not really contra-indicated but simply not indicated.

Of course it is quite evident that lavage should not be used in renal tuberculosis as much valuable time would be lost thereby and damage done at the same time. Again, calculous pyelitis is a contra-indication to lavage, unless it is used as an adjuvant to pyelotomy. Hydronephrosis would theoretically offer no indication for lavage, although a number of observers, chiefly Frenchmen, have noticed marked contraction of hydronephrotic sacs after these treatments. According to these workers, the improvement, i.e., the diminution in the amount of residual urine, is more marked in those cases where the pelvic distention is of so slight a degree or of so recent duration that the smooth muscle-fiber has not become too paretic to allow recovery of muscular tone. In these cases the stronger antiseptics, such as silver nitrate, which as we know is also an astringent, are of most service. When the hydronephrosis is beyond the early stage, e.g., when tumor formation is present, which would mean that the sac holds several ounces, very little can be hoped for in the way of diminishing the size of the sac by astringents.

Pyonephrosis is theoretically a contra-indication to pelvic lavage. It is true that some results have been obtained, chiefly of a palliative nature, in large pyonephrotic sacs and in these cases the retention ureteral catheter has been used to the greatest extent. However, the best that can be said for the procedure in these cases, is that it is palliative and is probably chiefly indicated where there is bilateral infection with considerable destruction of renal tissue on both sides. Here it is worth trying and might allow one to seize an opportunity for operative procedure on one or both sides.

VI. TABULATION OF CASES FROM THE LITERATURE FROM 1911 TO 1917

As has been explained before, the literature up to 1911 has been thoroughly covered in the three French thèses, of which the most complete is that of Perineau. These authors have collected and abstracted all the reported cases in which pelvic lavage was performed.

In the following tables the literature from 1911 to 1916 inclusive has been covered, but an attempt has been made to select the cases, the reports of which show that their authors have studied them in such a manner that they can easily be made to conform to the criteria which are represented in the case reports which follow. In these criteria, particular stress is laid on the report of the bacteriology, on the clinical result attained, on the number of lavages necessary to produce sterile urine, and on the time that such a condition has been followed — control examination. Other points of importance are also noted.

By such a selection of cases, we do not mean that reports of cases that do not measure up to these criteria are valueless, but merely that an attempt has been made to become informed through a study of the more recent literature, upon the finer points in the therapy, upon the underlying reasons for the successful results, and the goal to be striven for in order to attain them.

The first series of cases shows the results attained by lavage of the renal pelvis in acute and chronic pyelitis. In practically none of these 66 cases was anything more than lavage done.

SUMMARIES OF HISTORIES OF 66 CASES OF PYELITIS TREATED BY PELVIC LAVAGE

CASE 1. Reported by Pilcher. (No. 1.) Chronic right-sided pyelitis of pregnancy. Urine cloudy, 30 ccm. retention, containing pus-cells and bacillus coli. First lavage 20 per cent argyrol, 7 days later lavage with 40 per cent argyrol. Results: cure and normal labor 3 weeks later.

CASE 2. Reported by Pilcher. (No. 2.) Acute bilateral pyelitis of pregnancy. One lavage with 25 per cent argyrol. Result: lavage was valueless and was forced to empty the uterus 7 days after the lavage. Patient recovered.

CASE 3. Reported by Pilcher. (No. 3.) Chronic left pyelitis in the seventh month of pregnancy. Urine contained pus-cells but was sterile. One lavage with 25 per cent argyrol improved the pyuria and the patient was discharged cured one week after the second lavage.

CASE 4. Reported by Pilcher. (No. 4.) Acute left pyelitis. Urine contained pus-cells but was sterile. Temperature was normal three days after lavage with argyrol. Result: cured on the sixth day.

CASE 5. Reported by Walsh. (No. 1.) Chronic right pyelitis. Urine cloudy and contained gonococci. One lavage with 8 per cent argyrol. Result: cured; urine normal 3 months later.

CASE 6. Reported by Walsh. (No. 2.) Chronic bilateral pyelitis. Urine contained staphylococci and diplococci. Lavage with argyrol. Result: urine normal for 3 weeks, was followed by a relapse in the right kidney which was cured by 6 lavages with argyrol as high as 15 per cent, and at 3 to 10-day intervals extending over a period of 3 months.

CASE 7. Reported by Cifuentes. (No. 1.) Chronic bilateral pyelitis. Urine cloudy with pus-cells. Right

pelvis showed 22 ccm. retention; lavage with silver nitrate 1/1000; markedly relieved by first lavage. Eight lavages followed at 4-day intervals. Result: cured.

CASE 8. Reported by Cifuentes. (No. 2.) Chronic left pyelitis. Urine cloudy with pus-cells. Lavages with silver nitrate 1/1000 eleven times in 3 weeks. Result: relapsed in 2 months but cured by subsequent lavages.

CASE 9. Reported by Cifuentes. (No. 3.) Chronic bilateral pyelitis. Urine cloudy with pus-cells, bacillus coli. Lavages with silver nitrate 1/1000 alternately on each side 4 times in 2 months. Result: relapse in 4 months which was cured by subsequent lavages.

CASE 10. Reported by Santini. Acute left pyelitis. Urine cloudy with pus-cells, bacillus coli. Pelvis showed 50 ccm. retention. Lavage with potassium permanganate 1/5000 was followed by marked relief for 2 days, when a relapse occurred which was cured by one lavage with silver nitrate 1/1000 and a retention urethral catheter.

CASE 11. Reported by Wiener. Acute left pyelitis with 30 ccm. of pelvic retention. Lavage with silver nitrate 1/500. Relapse one week after second lavage. Result: cured by third lavage.

CASE 12. Reported by Lehr. Chronic left pyelitis with gonococci. Lavage with argyrol 10 per cent, and no relief even after a second lavage with argyrol 30 per cent. Five subsequent lavages with silver nitrate 1/3000. Result: urine sterile 2 weeks after the last lavage.

CASE 13. Reported by Hunner. (No. 1.) Chronic right pyelitis. Urine cloudy, bacillus coli. Lavage with silver nitrate 1/1000 and urine rendered sterile after one treatment. Two more lavages given after the urine became sterile.

CASE 14. Reported by Hunner. (No. 2.) Chronic bilateral pyelitis. Lavage with silver nitrate 1/3000, 6 times. Result: cured. Relapse in right kidney cured with silver nitrate 1/1000.

CASE 15. Reported by Hunner. (No. 3.) Chronic left pyelitis with bacillus coli. Lavage with silver nitrate 1/3000 five times at 6-day intervals. Result: urine sterile one month later. Right pyelitis 6 months later cured by 6 lavages.

CASE 16. Reported by Hunner. (No. 10.) Chronic left pyelitis with bacillus coli. Lavage with silver nitrate 1/1000 three times. Result: urine rendered sterile.

CASE 17. Reported by Hunner. (No. 21.) Chronic right pyelitis. Urine creamy. Lavage with silver nitrate 1/3000 and fever fell the next day. One more lavage 3 days later. Result: death 2 weeks later. The patient had mitral stenosis and was 5 months pregnant.

CASE 18. Reported by Hunner. (No. 23.) Chronic left pyelitis with bacillus coli. Lavage with silver nitrate 1/3000 three times at weekly intervals. Result: cured. Urine sterile after second lavage and also one month later.

CASE 19. Reported by Hunner. (No. 25.) Chronic right pyelitis. Urine contained pus-cells and bacillus coli. Lavage with silver nitrate 1/1000 six times at 5-day intervals. Result: cured. Urine sterile on the eleventh day and also 2 months later.

CASE 20. Reported by Stossmann. (No. 1.) Chronic left pyelitis. Lavage with silver nitrate and followed by a second lavage 4 days later. Result: cured in a week.

CASE 21. Reported by Stossmann. (No. 6.) Chronic left pyelitis. Urine cloudy with pus- and blood-cells. Lavage with protargol 15 per cent followed on the fifth day by lavages every two days until the eighteenth day. Result: cured.

CASE 22. Reported by Geyerman. (No. 8.) Chronic bilateral pyelitis. Urine contained gonococci. One lavage with silver solution and retention urethral catheter for 5 days. Result: cured.

CASE 23. Reported by Gaigl. (No. 9.) Chronic bilateral pyelitis. Urine contained pus-cells and bacillus coli. Six lavages with collargol 5 per cent twice a week for 3 weeks. Result: not cured. Pus-cells and bacillus coli present on discharge.

CASE 24. Reported by Cuturi. (No. 1.) Chronic left pyelitis. Urine contained pus- and blood-cells, streptococci and Bilharzia. Lavage with silver nitrate 1 per cent followed by 10 more lavages in a month with increasing strengths of silver up to 3 per cent. Result: improved. Hematuria and pain relieved.

CASE 25. Reported by Cuturi. (No. 2.) Acute right pyelitis with pus-cells, gonococci and 40 ccm. of pelvic retention. Eight lavages in 2 weeks with silver nitrate 2 per cent. Result: cured.

CASE 26. Reported by Cuturi. (No. 3.) Acute bilateral pyelitis with bacillus coli. Lavage with silver nitrate 1 per cent and relief for 15 days when relapse occurred. Result: cured. Labor 6 weeks later; 5 more lavages needed to clear the urine and effect a cure.

CASE 27. Reported by Voron. Acute left pyelitis. Urine contained pus-cells and bacillus coli. Lavage with collargol followed by immediate relief of the symptoms. Result: cured.

CASE 28. Reported by Spengler. (No. 3.) Chronic right pyelitis. Urine cloudy with pus-cells and bacillus coli. Pelvic retention 20 to 25 ccm. Lavage with silver nitrate 1/500, followed by relief 2 days later. Result: cured. Urine sterile 9 days later.

CASE 29. Reported by Spengler. (No. 9.) Acute bilateral pyelitis. Urine cloudy with pus-cells and bacillus coli. Pelvic retention in right kidney 25 ccm., in left 30 ccm. Lavage with silver nitrate 1/1000, each side alternately for 5 times. Result: not improved and therapeutic abortion necessary. Urine cleared in 2.5 weeks after this.

CASE 30. Reported by Albrecht. (No. 3.) Acute bilateral pyelitis. Urine cloudy with pus-cells and bacillus coli. Right kidney showed 18 ccm. retention. Repeated lavages with silver nitrate and urine was normal 4 weeks later.

CASE 31. Reported by Ruebsamen. (No. 1.) Chronic right pyelitis with bacillus coli and 20-ccm. retention. Lavage with protargol 5 per cent and urine sterile 4 days later. Result: cured. Patient 8 months pregnant.

CASE 32. Reported by Ruebsamen. (No. 2.) Acute right pyelitis. Urine cloudy. Contained bacillus coli and diplococci. Pelvic retention 40 ccm. Lavage with protargol 5 per cent. Result: cured 8 days later. Patient 8 months pregnant.

CASE 33. Reported by Ruebsamen. (No. 3.) Acute left pyelitis. Urine cloudy, bacillus coli, pelvic retention 100 ccm. A postpartum case. Lavage with protargol 5 per cent; pelvic retention and symptoms relieved 4 days later. One more lavage with silver nitrate 1/500 because of the presence of bacillus coli. Left kidney sterile 3 days after the second lavage. Bladder sterile 2 weeks later. Result: cured.

CASE 34. Reported by LeFur. (No. 3.) Chronic right pyelitis. Urine cloudy with pus-cells and bacillus coli. Pelvic retention 45 ccm. Eight months pregnant. Lavage with silver nitrate 3 per cent. Result: cured.

CASE 35. Reported by LeFur. (No. 6.) Chronic right pyelitis. Urine cloudy. Pelvic retention 60 ccm. Pregnant 5 months. Lavage with silver nitrate 2 per cent, followed by one more and a retention catheter for 24 hours. Result: cured.

CASE 36. Reported by Brongersma. (No. 1.) Chronic right pyelitis. Urine contained pus- and blood-cells and

bacillus coli. Pelvic retention 30 ccm; pregnant 4 months; lavage with silver nitrate 1 per cent. Result: cured.

CASE 37. Reported by Hohlweg. (No. 1.) Chronic right pyelitis. Urine contained bacillus coli. Lavages with silver nitrate 1/200 twice a week for 2.5 weeks. Result: cured. Urine sterile 18 months later.

CASE 38. Reported by Hohlweg. (No. 2.) Acute left pyelitis. Urine contains pus-cells and bacillus coli. Lavage with silver nitrate 1/200 twice. Result: cured. Urine sterile 2.5 years later.

CASE 39. Reported by Hohlweg. (No. 3.) Chronic left pyelitis. Urine contained pus-cells and bacillus coli. Lavage 4 times with silver nitrate 1/1000 increasing to 1/200. Result: cured. Urine sterile 1 year later.

CASE 40. Reported by Hohlweg. (No. 4.) Chronic left pyelitis of 7 years' duration. Urine contained pus-cells and staphylococci; pelvic retention 100 ccm. Lavage 4 times with silver nitrate. Result: cured. Urine sterile 2 years later.

CASE 41. Reported by Hohlweg. (No. 5.) Chronic bilateral pyelitis. Urine contained pus-cells and bacillus coli. Lavage 4 times with silver nitrate 1/200. Relapse in the right side 7 months later cured by 2 more lavages. Result: cured. Urine sterile 14 months after relapse.

CASE 42. Reported by Hohlweg. (No. 6.) Chronic left pyelitis. Urine contained bacillus lactis aerogenes. Lavage twice with silver nitrate 1/200. Result: cured. Urine sterile 18 months later.

CASE 43. Reported by Hohlweg. (No. 7.) Chronic left pyelitis. Urine contained pus-cells and bacillus coli. Lavage with silver nitrate. Urine sterile 15 days later. One more lavage. Result: cured. Urine sterile 21 months later.

CASE 44. Reported by Hohlweg. (No. 8.) Chronic right pyelitis. Urine contained pus-cells and bacillus coli. Lavage with silver nitrate 3 times. Result: cured. Urine sterile 4 months later.

CASE 45. Reported by Hohlweg. (No. 9.) Chronic bilateral pyelitis. Urine contained pus-cells and bacillus coli. Lavage 13 times with silver nitrate 1/200. Result: cured. Right kidney sterilized by 7 lavages, and left kidney by 6.

CASE 46. Reported by Hohlweg. (No. 10.) Acute right pyelitis. Urine contained pus-cells and bacillus coli. Lavage with silver nitrate 1/4000. Result: cured. Urine sterile 12 months later.

CASE 47. Reported by Hohlweg. (No. 11.) Acute right pyelitis with pus-cells and bacillus coli. Lavage with silver nitrate 5 per cent twice and 1/500 once. Result: cured. Urine sterile 10 months later.

CASE 48. Reported by Hohlweg. (No. 13.) Chronic right pyelitis. Urine cloudy with pus-cells and bacillus paratyphosus. Lavage with silver nitrate 1 per cent and perhydrol 0.75 per cent. Relapse 5 months later. Nine more lavages with same solutions. Result: clinically cured but the bacteruria persisted. Only improved, as the urine was not sterilized.

CASE 49. Reported by Hohlweg. (No. 14.) Chronic right pyelitis. Urine contained pus-cells and bacillus coli. Lavage with silver nitrate 1/400 and argyrol 5 per cent followed by three more with increasing strengths of silver up to 1/150. Result: cured. Urine sterilized in 22 days and again found sterile 3 months later.

CASE 50. Reported by Hohlweg. (No. 15.) Chronic right pyelitis. Urine contained pus-cells and bacillus coli. Lavage twice with silver nitrate 1/1000 and argyrol 5 per cent. Urine sterilized in 10 days. Result: cured. Urine sterile 4 months later.

CASE 51. Reported by Hohlweg. (No. 17.) Acute right pyelitis. Urine cloudy with pus-cells and bacillus

coli. Two lavages with silver nitrate 1/500. Result: cured. Urine sterile 6 weeks later.

CASE 52. Reported by DeGottal. (No. 1.) Chronic right pyelitis. Urine cloudy with pus-cells; mixed infection. Pelvic retention 25 ccm. Lavage with silver nitrate 8 times in 4 weeks and catheter left in over night each time. Result: cured. Urine normal one month later.

CASE 53. Reported by DeGottal. (No. 2.) Acute right pyelitis. Urine cloudy with pus-cells. Lavage 10 times at 3 to 10-day intervals with silver nitrate 1/1000 increasing to 2 per cent, the catheter being left in over night. Result: cured. Urine normal 3 months later.

CASE 54. Reported by Violet. Chronic right pyelitis. Urine contained pneumococci; pelvic retention 100 ccm. Lavage with silver nitrate 1/1000 followed by two more with 1/500 and 1/200. Result: cured. Pyuria relieved but distention not diminished.

CASE 55. Reported by Geraghty. (No. 1.) Acute right pyelitis. Urine cloudy with pus-cells and bacillus coli. Lavage with silver nitrate 1/200 with improvement, followed by one more 4 days later. Result: cured.

CASE 56. Reported by Geraghty. (No. 2.) Chronic bilateral pyelitis. Urine contained pus-cells with bacillus coli and staphylococcus albus. Lavage with silver nitrate 1/200 once without result. Two more lavages with 2 per cent and one more with 5 per cent; urine was sterile 3 days after the last. The staphylococci were dislodged by the 2 per cent but the 5 per cent was necessary for cure. Result: cured.

CASE 57. Reported by Geraghty. (No. 3.) Chronic bilateral pyelitis. Right urine cloudy and contained bacilli and cocci. Left urine clear and contained only cocci. Lavage once with formaldehyde 1/4000 without result. Lavages with silver nitrate 1/200 to 1/50 without result but cured by 3 per cent. Result: cured. Urine sterile one month later.

CASE 58. Reported by Geraghty. (No. 4.) Chronic left pyelitis. Urine cloudy with pus-cells and staphylococcus albus. One lavage with formaldehyde 1/4000 without result; the same result with silver nitrate 1 per cent but cured by 5 per cent. Result: cured. Urine sterile 6 months later.

CASE 59. Reported by Walther. (No. 1.) Acute bilateral pyelitis. Urine contained pus-cells and bacillus coli. Right pelvis held 5 ccm., left held 15 ccm. Lavage once with silver nitrate 1/500; temperature fell in a few hours. Relapse 4 weeks later controlled by silver nitrate 1/200; a second relapse 2 weeks after the first required 2 per cent silver to control it. Result: cured.

CASE 60. Reported by Aynesworth. (No. 2.) Acute right pyelitis. Urine purulent and contains bacilli. One lavage with water followed by immediate relief. Result: cured.

CASE 61. Reported by Aynesworth. (No. 4.) Acute right pyelitis. Urine cloudy with pus-cells, bacillus coli, and staphylococci. Lavage with argyrol 10 per cent, followed by another 5 days later. This resulted in an immediate fall in the temperature; a relapse occurred, however, 2 months later but this was controlled by 2 more lavages. Result: cured.

CASE 62. Reported by Aynesworth. (No. 5.) Acute bilateral pyelitis. Right urine cloudy, left clear. Both urines contained pus-cells and bacillus coli. Lavage with argyrol 10 per cent with normal temperature on the fourth day after it. Five more lavages. Result: cured.

CASE 63. Reported by Hoover. (No. 1.) Chronic bilateral pyelitis. Urine contained pus-cells, gonococci, and bacillus coli. Lavage with argyrol 5 per cent six times. Result: cured. Left kidney sterilized after

third lavage. Bladder urine sterile 2 weeks after the last lavage.

CASE 64. Reported by Hoover. (No. 2.) Chronic right pyelitis. Urine contained pus-cells and gonococci. Lavage 4 times with argyrol 5 per cent. Result: cured. Right kidney sterilized after third lavage; bladder urine sterile 3 weeks after last lavage.

CASE 65. Reported by Simons. (No. 3.) Acute right pyelitis. Right urine cloudy with pus containing bacillus mucosus capsulatus. Lavage with silver nitrate 1/200 and urine sterile on fourth day after. One more lavage with 1 per cent and another with 1/200 at 4 and 5 day intervals. Result: cured. Patient well 6 months later.

CASE 66. Reported by Simons. (No. 4.) Chronic bilateral pyelitis. Right urine contained some pus, and left contained a great deal. Both showed streptococci and Gram-positive bacilli. Right pelvic retention 21 ccm. Left nephrotomy done but valueless. Bilateral lavage with argyrol 5 per cent followed by three more with silver nitrate 1/200, 1 per cent and 2.5 per cent; clinically improved but bacteria persisted. Went home for 50 days and on return was lavaged with silver nitrate 1.5 per cent. Discharged at his own request but while he was clinically improved the urine was not rendered sterile.

A consideration of these case abstracts shows among other things the following points of interest:

The 66 cases represent pyelitis, both acute and chronic, unilateral and bilateral, with or without distention. Among the 66 cases were 19 whose pelvis or pelves showed distention. Among these 19 cases, 16 showed a pelvic retention of 15 to 60 ccm. and could easily fall in the class of slight hydronephroses; in all but 2 of these cases, cures were obtained but no mention is made of the size of the pelvis after cure. Three cases showed retention of 100 to 110 ccm., and these were all cured by lavage, but in one of these mention is made of the fact that the distention was not relieved.

The bacteriology of the 66 cases shows 33 pure bacillus coli infections. The list is as follows:

Bacillus coli.....	33
Gonococcus.....	5
Mixed infection.....	9
Staphylococcus.....	1
Bacillus lactis aerogenes.....	1
Bacillus mucosus capsulatus.....	1
Bacillus paratyphosus.....	1
Pneumococcus.....	1
Staphylococcus albus.....	1
Bacilli.....	1
Sterile.....	2
Bacteriology not mentioned.....	10

66

It is of interest that cure is obtained without regard to the type of bacteria with which the kidney is infected and relapse or permanent failure is due to other causes. However it is

singular that the only paratyphosus case was among the failures.

The antiseptics used in lavaging the 66 cases were as follows:

Silver nitrate 1/4000 to 1/200.....	25
Silver nitrate 1/200 to 5 per cent.....	8
Argyrol 5 to 40 per cent.....	11
Potassium permanganate 1/4000.....	1
Silver solution.....	6
Protargol 5 to 15 per cent.....	4
Collargol 5 per cent.....	2
Water.....	1
Several solutions.....	8
	66

As a rule most workers preferred lavages with weak silver nitrate solutions rather than instillations with stronger, although those who used the stronger solutions claim that their success was due only to them, they having tried the weaker in most of the cases before resorting to the stronger. However it is possible that a few more lavages with the weaker solutions might have given the same desired results. It is of interest that practically all solutions are successful and failure seems to be due to other causes.

The number of lavages required is of the utmost importance to the urologist, as it enables him to estimate the time to be consumed for cure, meaning of course for the most part bacteriological cure.

Of 66 cases 12 were cured by one lavage, 13 were cured by two lavages; 34 were cured only after three or more lavages; 7 were not cured by lavage.

This means that a little less than two-fifths of the cases require not more than three cystoscopies to produce and prove sterility of the pelvic urine. In proving a cure it is important to get the control urine by ureteral catheter as the bladder may remain infected and even obstinately so for some time after the kidney has been sterilized.

In very few cases was it necessary to lavage the pelvis more than half a dozen times.

Cure was obtained in 59 of the 66 cases and the procedure failed in 7 cases. This high percentage of cures is due to the fact that most of the cases in the literature in which the procedure failed came to operation in as much as the procedure was not indicated in those cases and are hence not in this series. In other words, 89 per cent represents the success that should be attained in cases in which lavage should be done. This point is elaborated upon in another section.

URETERAL CATHETERIZATION AS A THERAPEUTIC MEASURE

As has been brought out in a previous section, there is no doubt that some of the benefits that result from lavage of the renal pelvis ensue on the relief of the retained urine, which is in a state of stasis in the pelvis. This relief is in all probability due to the opening up of the ureteric channel, which is blocked by purulent secretion or an œdematous condition of the ureter. This same condition of relief occurs at times spontaneously with a gush of pus into the bladder, the urine of which had been previously negative for pus-cells and with this appearance of pus-cells the general symptoms abate at least for a time. The entire rationale of therapeutic ureteral catheterization is based upon this theory and upon the fact that practice bears it out.

For some reason the cases in the literature between 1911 and 1917 in which mere ureteral catheterization has been of curative value have all been those of pyelitis of pregnancy or the puerperium.

They number in all 12 antepartum and 6 postpartum cases.¹ In practically all these cases there was a rapid fall of the temperature within a dozen hours after mere catheterization of the ureter or ureters. In 14 cases one catheterization was sufficient; in 4 cases 2 were necessary. In 11 antepartum cases out of 12, the patient went on to term, whereas there was strong probability that she would have aborted without the procedure. In only one case was the uterus emptied and then by vaginal cæsarean section.

In a few cases, not included in this series, it was necessary, on account of the failure of several ureteral catheterizations, to resort to lavage or retention catheter or both.

In some cases clinical relief was obtained and after the gestation the urine was rendered sterile by lavage.

It is difficult to explain exactly how a single catheterization can give such relief, but the clinical result is very plain to those who have observed it. Any objection to lavage, as possibly giving insult to a damaged kidney, is waived in this instance.

The chief exponent of this measure is Mansfeld, who in his series of pyelitides of pregnancy, reports ten cases treated in this manner, and all with excellent results. The obstruction in these

cases is thought by some to be due to the pregnant uterus, but this explanation is looked upon with skepticism by others. Many report difficulty in passing the catheter at a point 10 to 15 cm. from the ureteric mouth. Mansfeld says: "When one has catheterized many ureters in pregnancy one comes to the conclusion that it is certainly not the pregnant uterus that acts as a mechanical hindrance." It must again be insisted upon that these conditions are not strictures.

Whatever the explanation may be, the fact remains that the procedure is efficacious and that it is of most benefit or has been used with the greatest effect in pyelitis of pregnancy. Its simplicity is another argument against therapeutic abortion, and the rapidity with which results are obtained render it justifiable in the most extreme cases, where oliguria or even anuria have occurred, as little time will be lost in case the procedure fails utterly.

THE RETENTION URETERAL CATHETER

In the minds of some it is questionable whether it is ever advisable to leave a ureteral catheter *in situ* longer than a couple of hours. Certainly most patients in this country do not tolerate the procedure as well as those which I have seen abroad. However it can be said that in all probability the mucous membrane will not be damaged as the woven catheter will become very soft in moisture at body heat.

HISTORIES OF 12 CASES IN WHICH THE RETENTION URETERAL CATHETER WAS USED

CASE 1. Reported by Stossmann. (No. 7.) Post-operative pyelitis complicated by urethral polyp. Case was too bad for operation. Catheter left in place 5 days. Result: failure.

CASE 2. Reported by Mansfeld. (No. 5.) Bilateral pyelitis in a patient 5 months pregnant. Right catheter left in place 10 hours; left catheter 48 hours. Result: failure. Forced to do abortion.

CASE 3. Reported by Mansfeld. (No. 18.) Bilateral pyelitis with bacillus coli. Catheters left in place 10 hours. Clinically cured in 3 days.

CASE 4. Reported by Gaigl. (No. 3.) Right pyelitis of pregnancy; about to abort. Result: aborted. Urine unimproved by the procedure.

CASE 5. Reported by Hartmann. (No. 13.) Right pyelitis. Catheter left in place 12 hours. Result: cured with the assistance of lavage.

CASE 6. Reported by Albrecht. (No. 1.) Bilateral pyelitis with bacillus coli. Catheters left in place one hour each time for 6 times. Result: some improvement but cured by lavage.

CASE 7. Reported by LeFur. (No. 5.) Very chronic pyelitis with pelvic retention of 120 ccm. Catheter left in place 48 hours. Result: cure obtained when lavage had failed.

CASE 8. Reported by LeFur. (No. 7.) Very chronic pyelitis with pelvic retention of 60 ccm. Result: did not cure or reduce the amount of retention.

¹ Glendining. Case 1.
Jorgensen-Wedde. Cases 1 and 2.
Tassius. Case 1.
Mansfeld. Cases 1, 2, 3, 10, 11, 15, 19, 20, 21 and 22.
Gaigl. Cases 5 and 6.
Simons. Cases 1 and 2. Rep. Am. Urol. Ass., 1917.

CASE 9. Reported by Brongersma. (No. 2.) A case of pyelitis of pregnancy in which lavage had failed. Catheter left in place 30 days. Result: failure — abortion occurred and then the urine cleared.

CASE 10. Reported by Hohlweg. (No. 16.) Pyelitis in which lavage had failed to sterilize the urine. Retention catheter twice for 24-hour periods. Result: failure.

CASE 11. Reported by Squicciarini. (No. 2.) Pyelitis in which lavages had failed. Catheter left in place 5 days. Result: cured.

CASE 12. Reported by Pilcher. (No. 6.) Pyelitis with a pelvic retention of 135 ccm. Catheter left in place 5 hours. Result: cured but associated with argyrol lavages.

In the small series of 12 cases in which the procedure was used and well reported during 1911 and 1917, the following results were noted:

In 6 cases it was a complete failure and either had to be removed on account of pain, or abortion occurring, or because it did not aid in attaining a sterile urine. In 3 cases it attained a cure by being assisted with more or less pelvic lavage. In 3 cases it attained a cure where lavage had previously failed.

It should be remembered that much was demanded of it, because in all the cases in which it had been used, lavage had proven a failure, so that they were no doubt cases of very stubborn infection. There is no question but that there is a distinct indication for the use of the retention ureteral catheter, and this has been discussed in a previous section. Suffice it to say, however, that it should always be held in reserve in cases where the infection resists lavage for a reasonable length of time and especially where this is associated with marked pelvic residual urine, and one is suspicious that the contour of the sac is contributing to the failure. Here pyelography should be brought into play and the use of the catheter be made dependent on the findings.

HISTORIES OF FOUR CASES OF INFECTED HYDRONEPHROSIS IN WHICH THE SIZE OF THE PELVIS WAS REDUCED BY PELVIC LAVAGE

CASE 1. Reported by Hunner. (No. 4.) Bilateral pyelitis with multiple strictures of the ureter. Capacity of right pelvis, 100 ccm.; of left pelvis, 120 ccm. Lavaged with silver nitrate 1/500 about 13 times. Result: right pelvis reduced to 60 ccm.; left reduced to 35 ccm.

CASE 2. Reported by Ruebsamen. (No. 3.) Left postpartum pyelitis. Pelvic capacity 110 ccm. Lavage with protargol 5 per cent once. Result: no stasis after one lavage.

CASE 3. Reported by LeFur. (No. 4.) Left pyelitis of pregnancy. Pelvic capacity of 160 ccm. Lavage with argyrol 5 per cent once. Result: second test showed pelvic capacity reduced to 40 ccm.; third test showed a reduction to 18 to 20 ccm.

CASE 4. Reported by Fritz. (No. 1.) Left pyelitis with a pelvic capacity of 500 ccm. Lavage with silver nitrate every third day. Result: pelvis returned to normal size.

From the few cases here recorded it is plain that rather marked reductions in the capacity of the sacs have been observed.

However, it may be said that in most cases in which the pus was thick, lavage proved of little or no use and the case was soon suspected of being pyonephrosis and operation was necessary and proved the condition.

VII. PROGNOSIS

In considering the postmortem findings and the findings in the operating room, it is a striking thing that uncomplicated pyelitis has practically no mortality. This must mean that no matter how severe the febrile symptoms may at times be, fatal renal insufficiency rarely occurs. In some cases anuria (usually only oliguria) occurs, but this is as a rule of short duration. The hyperpyrexia seems to be well borne, probably because of the rapidly following remissions and the continuous fever and typhoid state so common in multiple septic infarct is almost never encountered. If there is always a bacteræmia, as has been demonstrated in some cases, the organisms are usually taken care of in the body or excreted, as metastases, especially in colæmia, are practically unknown.

In spite of this picture of favorable prognosis in untreated uncomplicated acute pyelitis, it should be remembered that the same can not be said of pyelitis accompanied by stones, nor can we say in any given case whether the renal parenchyma is already infiltrated with pyogenic bacteria, and if so, to what extent it is involved and to what stage these foci have advanced, as there is a grave possibility of abscess formation with subsequent pyonephrosis.

Again, in cases where there is obstruction with pelvic retention, there is grave danger of infected hydronephrosis. And lastly and of most importance, it should be borne in mind that most cases of acute pyelitis result in chronic pyelitis, and in infections of all mucous membranes the longer the organisms are active the more apt are they to produce deeply seated lesions, to intrench themselves, and on account of the difficulty in dislodging them, to result in repeated exacerbations, all of which lay the patient liable to the complications above mentioned.

On account of all these things, in discussing prognosis, one should consider the following:

The history of duration of the case is of the utmost value. Given a case of apparently uncomplicated acute pyelitis, and the prognosis under lavage is good. It is immaterial if there is associated pregnancy, as one should expect

to carry the pregnant woman on to term with pelvic lavage, and after labor the outlook for drainage is better. One should never consider abortion as a therapeutic measure except in the most extreme cases. The severity of the constitutional symptoms is no indication of bad prognosis, unless the patient is practically in the typhoid state.

The ureteral catheter at times offers data in establishing prognosis. If the catheter drains very little or there is thick purulent material in the renal pelvis, which does not wash out easily, the outlook is of course worse. Such a condition as the latter would of course suggest the possibility of pyonephrosis. Again, if the urine obtained contains bacteria but very few pus-cells, and the symptoms are severe, the prognosis is not so good, as there is a possibility of septic infarction. The presence of pus-cells and bacteria from both kidneys does not, strange to say, seem to increase the gravity of the prognosis, although it may be said that it usually requires a greater number of lavages and consequently a more extended treatment.

Bacteriology seems to give little data in prognosis. Although the colon bacillus is the common finding, the other organisms, such as gonococcus, staphylococcus, streptococcus, bacillus mucosus capsulatus, pneumococcus, etc., seem to be dislodged about as easily. One case of paratyphosus infection (Hohlweg, Case 13) could not be permanently cured by lavage. Mixed infections, especially those with gram-positive bacilli, seem to be very stubborn. The presence of staphylococci and streptococci should put one on his guard as to the possibility of cortical infection and consequently a graver prognosis.

Physical examination at times gives some data for prognosis. The presence of an easily palpable mass on the offending side should suggest the possibility of pyonephrosis. In going over the literature, it is easy to see that most of the cases in which lavage failed have come to operation, revealing pyonephrosis, possibly with stones and like advanced lesions of the kidney; hence the failure is not to be attributed to the lavage but to the faulty diagnosis and imperfect indication for the procedure.

In chronic cases, radiography should be used to eliminate calculi if possible, and associated with pyelography may reveal marked distortion of the renal pelvis and hence give a poor prognosis under lavage treatment or perhaps a contra-indication to it.

Finally, it can not be too strongly insisted that lavage of the renal pelvis has a very limited,

though very successful and important field, and that an accurate selection of cases should be made by thorough study. Consequently lavage will be contra-indicated in certain correctly studied cases, whereas it would otherwise have been considered as having failed if the cases had not been so studied.

VIII. WHAT IS A CURE AND WHAT CONDITION SHOULD WE STRIVE TO ATTAIN?

These questions have been practically answered here and there in the preceding pages. Having realized that pyelitis is a condition of local infection of the pelvis of the kidney, more or less associated with inflammation of the parenchyma, and with more or less pelvic retention due to inflammatory swelling of the ureteral mucosa or blocking by purulent secretion, we should strive to relieve the constitutional symptoms by relieving the obstruction, and we should furthermore strive to prevent the further infection of the renal parenchyma by sterilization of the urine. At times if the first end is attained, the second follows automatically.

Should it not, the procedure should be continued, whether it be lavage or some other, until the renal urine is absolutely free of pyogenic bacteria. The mere relief of the pyuria is absolutely insufficient, as most of the cases in which the bacteria persist, even in the absence of pus-cells, are doomed to relapse. It can not be too strongly emphasized that only a bacteriological cure is an adequate cure.

Remembering that most cases react to half a dozen lavages, one should begin to be suspicious when this point is reached and the pyuria and bacteruria are not improved, that the diagnosis of pyelitis may be at fault, inasmuch as practically all the failures laid at the door of pelvic lavage are to be attributed to faulty diagnosis.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Chaput, H.: Deep Immovable Sutures of the Abdominal Wall with Silkworm Gut (Sutures profondes, amovibles de la paroi abdominale aux crins de Florence, par le procédé du noeud coulant). *Presse méd.*, 1917, p. 410.

Chaput says that deep catgut sutures of the abdominal wall sometimes become absorbed before there is perfect reunion and thus favor eventration. Silk sutures favor suppuration and fistulization. Wire has disadvantages also.

The silkworm gut slip-knot or running knot method described by Chaput has none of these disadvantages. It holds the edges firm and immovable as long as necessary; the silkworm gut slip-knots can be removed by the tenth or eleventh day. They are not absorbed and there are no fistulae. The cutaneous edges can be separated without disturbing the deep edges.

The technique is as follows:

A Reverdin needle is passed through the edges of the two recti muscles; the middle of a silkworm gut is pressed into the eye and the needle drawn back toward the operator. The two ends of the gut are then passed through the loop to form a slip-noose. Before tightening this noose a piece of silk thread is passed through the loop and its two ends knotted. This is to serve later on to withdraw the gut loop. The slip-noose is then pulled tight. The two ends of the silkworm gut are next passed through the cutaneous lip nearest the operator through two distinct needle holes made in a line parallel to the cutaneous incision but about two to three cm. from its edge. The ends are then knotted.

The cutaneous edges not being brought closely together by the ends of the slip-noose, in the case of subcutaneous suppuration, they can be separated without disturbing the deep sutures. When all the deep sutures are completed the cutaneous sutures are placed.

About the tenth or eleventh day the slip-noose can be removed. This is done by cutting the two ends of the deep sutures immediately under the knot. Traction is then made on the silk thread tied to the deep loop and the loop easily withdrawn.

W. A. BRENNAN.

Byford, H. T.: The Lower Abdominal Incision. *Illinois M. J.*, 1917, xxxii, 10.

The author protests against the indiscriminate use of long abdominal incisions to lessen adhesions. All exploratory work should be done through small incisions, enlarging subsequently when found necessary.

The following procedures are recommended to obviate the necessity of enlarging a short incision. Ordinarily an exploration of the lower abdomen should be done through an incision large enough to admit half of the hand. In operating bring the adnexa and movable viscera to the surface and deliver through a small incision, doing the work practically extraperitoneally. (This does not hold for work that cannot be done at the surface.) The oozing points should be treated by aspiration if feasible or if necessary through a tubular speculum rather than a large incision. It is better to aspirate all fluids, rather than use a sponge.

HENRY VAN DEN BERG.

Auvray: Extraction of Projectile Situated in the Pelvic Cavity Through Its Posterior Wall (Extraction, à travers la paroi postérieure du bassin, de projectiles situés dans sa cavité). *Presse méd.*, 1917, p. 386.

Auvray reports 3 cases of projectile extraction through the posterior pelvic wall.

In pelvic operations made through its posterior wall Auvray thinks it indispensable to make a route of approach through the soft parts which not only gives a full light but also allows the operator to easily reach the deep parts. In two operated cases he has been obliged to section a muscular flap in the gluteus maximus combining an incision made parallel to the direction of the fibers of the muscle with a more or less extensive disinsertion of its superior attachments. By raising or depressing this muscle-flap he has obtained a clear view of the deeper parts which the simple incision of the muscles parallel to its fibers did not give. The disinsertion of the gluteus maximus muscle at the level of its superior attachments does not create any functional trouble for the future if care is taken to reconstitute the attachments by suture. In his operated cases after recovery the patients could keep themselves erect, walk normally, and

effect trunk movements of the normal degree without trouble.

In the first of the three cases reported Auvray disinserted the large sacrosciatic ligament and added resection of the lower part of the sacrum as in the Kraske operation which gave a wide route to the posterior rectal region where the projectile was situated.

In the second case the penetration into the pelvis was through the upper part of the sciatic notch after transversal section of the sacrosciatic ligament through its whole thickness.

In the third case in order to enlarge the orifice of penetration of the projectile which reached the pelvis by the lower part of the sciatic notch Auvray sectioned and disinserted the sacrosciatic ligament on the sciatic spine. The breach thus made gave sufficient light to pass an instrument with separated branches which seized the projectile at the bottom of a fistulous tract near the bladder.

W. A. BRENNAN.

Auvray: Sacro-iliac Suppurative Arthritis; End-Results of Articular Resection (Arthrites suppurées de la sacro-iliaque. Résultats éloignés de la resection articulaire). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1360.

In two cases of sacro-iliac joint suppuration following war wounds Auvray did a resection principally for the purpose of drainage. The chisel and mallet were used. In both cases the postoperative course was simple and the men have recovered from their very severe and extensive injuries which necessitated bloody and mutilating operations.

The end-result of the intervention has exceeded expectations. One of the men is perfectly straight when standing. He can walk long distances without aid and without pain. He has resumed his position on the firing line. Similarly with the second man except that he is fatigued after an hour's marching.

The author says that these two examples demonstrate that in spite of mutilating operations sacro-iliac joint resection may be followed by complete functional restoration.

W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Le Grand, J.: Color Fixation of Tissues Prior to Mechanical Disinfection (De l'emploi d'un fixateur colorant avant la désinfection mécanique). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1347.

Upon the advice of Delbet the author has carried into effect the idea of chemically fixing necrosed tissues along the trajectory of wounds before mechanical disinfection. Le Grand had added the coloration of the tissues, using a 10 per cent solution of methylene blue in 40 per cent formol. The tissues become less deeply colored in accordance with their healthy condition and the tint attained is the index of their condition. Necrosed tissue becomes strongly and deeply tinted, almost black. This test is

of great value in determining what tissues ought to be resected. Besides the mixture is bactericidal.

Le Grand is an advocate of resection and primary suture. In 165 cases of severe wounds he has immediately sutured 109—70 per cent. Of these 62 were wounds of the soft parts; 26 were fracture wounds; 21 were articular. Reunion was obtained *per primam* in 105 cases. The other 4 cases showed some complications but were finally cured.

The results shown in Le Grand's report, according to Delbet who submitted it, extend the possibility of preventive suture of wounds. The fact that he was able to carry out this procedure in a very large proportion of the severely wounded shows that the method is applicable to a more severe degree of cases and to older wounds than was formerly believed. Delbet thinks that the time is now far past when immediate secondary suture was boasted of as the last word in war surgery; and even later when some insisted on the dangers of primary reunion. He thinks that it is one of the glories of the young French school of surgery to have established the principle that war wounds differ only from other injuries by the extent of the disorganized tissues. On resection of such tissues the wounds become normal. The French idea also of asepsis as opposed to illusory antiseptics has opened up infinite possibilities.

W. A. BRENNAN.

Pugnat, A.: Treatment of Chronic Purulent Otitis Media (Traitement de l'otite moyenne purulente chronique). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 19.

The author profiting by the experience of the value of hypochlorites in war surgery employs as a dressing a mixture of hypochlorite and boric acid in the following proportions: hypochlorite of lime, 10 gr.; pulverized boric acid, 90 gr.

Success depends on the size of the tympanic perforation; with a slight perforation dressings have only a limited action. This method of treatment has given the author better results than others habitually employed.

W. A. BRENNAN.

Fiessinger, N., and Clagne, R.: The Antiseptic Action of Alkaline Hypochlorites and Particularly of Dakin-Daufresne Solution (L'action antiseptique des hypochlorites alcalins et, en particulier, de la solution de Dakin-Daufresne). *Compt. rend. Soc. de biol., Par.*, 1917, lxxx, 633.

From a research on the antiseptic action of alkaline hypochlorites the authors concluded:

1. Contrary to what is actually admitted hypochlorite of soda under the form of Dakin's fluid is a very weak antiseptic. Its germicidal activity varies according to the protein contents of the medium in which it works.

2. In pus, weak doses of Dakin's fluid activate bacterial propagation, and strong dosage is required to effect sterilization.

3. In muscular sections, in order to exert a sterilizing effect, a flow of about 10 ccm. per centimeter cube in twenty-four hours is necessary.

4. Such facts explain the constancy of infection of wounds treated by the Carrel-Dakin solution.

5. The diminution of bacterial density is not proof of the sterilizing action of Dakin's fluid, but rather of the liquefying action of this fluid on necrosed tissues which favor bacterial multiplication.

6. The possibility of secondary sutures and the evolution of epidermization are not arguments which testify to the sterility of a wound.

7. The fortunate results obtained by irrigation with Carrel-Dakin solution in the treatment of war wounds are not attributable to a sterilizing action, but rather to the strongly proteolytic action which hypochlorites possess; such action is observable macroscopically by the melting away of mortifying substances and the liquefaction of pus, and clinically by the transformation and splitting of albumin molecules. Carrel's method is a surgical lavage.

W. A. BRENNAN.

ANÆSTHETICS

Regnault, J.: The Choice of a Surgical Anæsthetic (Du choix de l'anesthésie chirurgicale). *Presse méd.* 1917, p. 396.

Regnault prefers local anæsthesia and uses novocaine-adrenaline or novocaine-suprarenin. Under such anæsthesia he has carried out major operations such as arm amputations, foot amputations, appendicitis, ovarian cyst, etc. In 900 operations carried out during the war he has used local anæsthesia in about three-fourths of the cases. For a general anæsthetic he thinks a mixture of chloroform and ethyl chloride prevents undue excitation and lessens the danger of laryngeal syncope.

W. A. BRENNAN.

Gaehlinger and Poiré: A New Method of Anæsthesia—Warm Ether (Une méthode d'anesthésie nouvelle—l'ether chaud). *Bull. et mém. Soc. de chir. de Par.*, 1917, p. 542.

Having observed secondary and late congestive phenomena in the lungs from the ether anæsthesia with cold vapor, the authors have conceived the idea of sending into the bronchii and lungs warm ether vapor. They pass the ether vapor through a bent tube plunged in hot water which is kept warm by a thermos bottle. They have practiced this in 250 to 300 cases, and never have had any immediate accident nor pulmonary complication. They have been able to continue anæsthesia up to 3 and 3.5 hours.

W. A. BRENNAN.

Leclerc, G.: Reflections on 200 Cases of Novocaine Spinal Anæsthesia (Reflexions sur deux cents cas d'anesthésie rachidienne à la novocaïne). *Lyon chir.*, 1917, xlv, 479.

The author thinks that novocaine spinal anæsthesia has these advantages: (1) it facilitates the change of the patient's position on the operating table and easily permits abdominal decubitus;

(2) there is preservation of the laryngeal reflex which prevents asphyxia and postoperative bronchopneumonia; (3) in laparotomy it avoids the thrust of abdominal viscera; (4) diminution or suppression of operative shock is the principal advantage.

The disadvantages are: (1) for some reason or other there may be a complete failure to effect anæsthesia; this is, however, very rare; (2) the anæsthesia may be insufficient as regards intensity or duration or extent of field.

To justly appreciate lumbar anæsthesia and the importance of the checks to which it is subject, it is necessary to carefully consider the dosage employed, the operative technique, and the points of injection, and the region in which the operation is to be done. As regards dosage the author employs three categories, i.e., less than 10 cg., 10 cg., and from 10 to 15 cg., the latter figure representing the maximum used; but the efficacy of anæsthesia does not depend on the strength of the dose, as experience has shown that in some cases the stronger the dose the greater the proportion of failures.

The site of injection is the first or fifth lumbar space. The author uses both equally well. The higher level not effected by anæsthesia differs for each patient and is not in agreement with the quantity injected. The most suitable level for spinal anæsthesia seems to be the first lumbar or the twelfth dorsal space.

As complications, there may be slight nausea or vomiting or headache. In one case there was deafness and labyrinthine phenomena; in 6 cases rachialgia and meningitis; in 2 cases some strabismus. All these disappeared in the course of time.

The author is of the opinion that spinal novocaine anæsthesia, though not a method of absolute security, renders great service, especially in cases of shock and wounds of certain regions.

W. A. BRENNAN.

Farr, R. E.: Abdominal Surgery Under Local Anæsthesia. *J. Lancet*, 1917, xxxvii, 353.

In considering this subject it is assumed that the requirements of the patient are paramount and that all other questions are of secondary importance. The choice of an anæsthetic is, in a measure, a matter of sentiment, and sentiment is created at the larger surgical centers. Whereas it is the custom of surgeons to limit the use of local anæsthesia to the cases in which general anæsthesia is contra-indicated, it is the author's belief that the reverse should be true and that general anæsthesia should be resorted to only when local anæsthesia is contra-indicated. The toxicity of novocaine is dependent upon the strength of the solution rather than upon the total amount used and its comparative safety makes possible the use of the drug in large quantities. When so used in conjunction with ample incision, careful manipulation, vertical retraction, and an appropriate position of the patient, its scope is greatly broadened. Perfect anæsthesia results in

negative intra-abdominal pressure, producing post-mortem-like repose which permits optical examination which is, of course, preferable to digital.

The contra-indications to local anæsthesia are largely limited to: (1) psychic incompatibility, a small percentage of cases, not excepting children on this account; (2) pathology adherent to the posterior parietal peritoneum; (3) adherent malignant disease; and (4) very high-lying gall-bladders.

With this method abdominal packs are not needed except to prevent soiling, orientation being obtained by the negative intra-abdominal pressure, vertical retraction, etc. It has the advantage of avoidance of the immediate and remote dangers of general anæsthesia, excellent exposure and perfect repose of the viscera, greatly reduced trauma, and a very marked decrease in such postoperative discomforts as gas, nausea, and vomiting with the resultant wound strain, in addition to the avoidance of loss of consciousness to which most people object. Children of all ages lend themselves especially well to the method.

The time required for the administration of local anæsthesia is greatly reduced by the use of the pneumatic injector, two to five minutes being all that is necessary, with proper technique, and the operation may be begun at once. The author has performed practically every abdominal operation by this method, some operations hundreds of times, and prefers it to all others. If the anæsthesia becomes inadequate for any case, general anæsthesia may be resorted to at any stage in the operation.

R. E. FARR.

SURGICAL INSTRUMENTS AND APPARATUS

Chambas: Apparatus for Immobilization of Fractures at Advanced Relief Stations (*Appareils pour immobilisation des fractures au poste de secours avancé*). *Presse. méd.*, 1917, p. 395.

Chambas describes the technical details of simple metallic apparatus destined to immobilize limb fractures during the transportation of the wounded from the first aid post to the ambulance, for the purpose of avoiding vascular complications and the diffusion of infection consecutive to the over-riding of fragments.

W. A. BRENNAN.

Speed, K.: The Bradford Frame in the Treatment of Buttock and Hip Injuries of War. *N. Y. M. J.*, 1917, cvi, 168.

On account of the size, and infection, of the above war injuries, manipulations for dressings, irrigations, and use of the bedpan, cause a great deal of pain.

In order to increase the comfort of patients suffering from war injuries of the buttock or hip; the author made use of the Bradford frame. This was prepared with the canvas divided into two parts, the opening approximating that necessary to fit the wound treated. By means of pillows, the

patient was made very comfortable on the sling thus arranged and the wounded area was left free in the opening, the frame being supported some six inches above the bed level, on firm blocks.

In such position, the wound can be readily taken care of and the patient made more comfortable.

The authors plead for a fair trial of the above method.

E. C. ROBITSHEK.

Gates, F. L.: A Valve to Regulate the Delivery of Air and Ether Vapor in Any Proportion. *J. Exp. Med.*, 1917, xxvi, 41.

Since the introduction of the Meltzer-Auer method of intratracheal insufflation for artificial respiration and anæsthesia in 1909, this method of delivering air and ether vapor under positive pressure at the bifurcation of the trachea has been widely adopted in laboratories of research and in the surgical clinic. The close regulation of air pressure and ether vapor tension, the constancy of delivery independent of the respiratory movements of the anesthetized subject, and above all, the safety and surety of the method in supporting life in spite of respiratory failure, combined with smoothness of anæsthesia and freedom from danger of aspiration pneumonia, make it, the author believes, the most satisfactory method for human as well as laboratory surgery.

An extensive literature has grown up in this country and abroad which by its character attests the success of the method in principle and practice. Most of the authors agree on the correctness of the principles involved; most of them have some contribution to make in the way of new apparatus for the simplification and perfection of the technique or the mechanics of the method, and many types of respiration machines have been described, according to Gates, their variety proving the wide flexibility of the method and its adaptability to individual preference and need.

Heretofore, as he states, the diversion of a portion of the air stream over the ether surface has been accomplished by means of stop-cocks in the tubing or some equivalent arrangement. The constant volume valve described by the author in this article is in essence a convenient means of regulating all three stop-cocks synchronously, so that as the air stream over the ether is increased, the stream through the other cock is reduced in exact proportion, and the sum of the volumes passing through the two limbs of the divided circuit remains constant. This valve consists of three channels, but all contained in a single block, and all regulated synchronously by a single cock key through which the three channels are drilled. It controls the ether vapor for anæsthesia which regulates the mixture of ether vapor from a Wouffe bottle with air in any proportion, without changing the volume or the pressure at which the mixture is delivered. The regulation of the air stream both to and from the ether bottle controls the mixture accurately and is an essential feature of the valve. Except for experimental purposes, the author does not consider it profitable

to determine on an arbitrary scale the tension of the ether vapor obtained, because the depth of the anæsthesia should always, he states, be judged by the condition of the subject.

The valve was devised for the Meltzer-Auer method of intratracheal insufflation, but Gates states that it is adapted for use wherever a constant mixture of air and ether vapor is desired. Several

respiration machines for supplying and interrupting the air stream, using this constant volume valve for the regulation of the ether supply, have been in use in Meltzer's laboratory for periods up to two years, and the simplicity and efficiency of the valve, he believes, have been thoroughly tested. He intends to publish later a description of the complete machine.

GEORGE E. BEILBY.

SURGERY OF THE HEAD AND NECK

HEAD

Morestin, H.: Lupus of the Chin Encroaching on the Lower Lip and the Right Cheek; Extirpation; Reconstitution of the Chin (Lupus du menton empiétant sur la lèvre inférieure et la joue droite; extirpation; reconstitution de la coque mentonnière). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1452.

In the case described by Morestin an old established lupus covered the whole chin encroaching on the lower lip and extending to the edges of the cheeks, particularly on the right side. The only treatment which seemed to promise a radical recovery was wide extirpation followed by immediate plastics. The extirpation left a vast defect. To fill it and re-form the chin projection the author used a large flap about 12 cm. long and two finger-breadths wide cut from the anterior part of the neck. The final result was imminently satisfactory in every respect.

Morestin thinks that when surgical treatment of lupus is realizable, and when it does not produce mutilation or one not easily reparable, this mode of treatment of lupus is the surest and most rapid.

W. A. BRENNAN.

Imbert, L., Lheureux, C., and Rouslacrox: Researches on Heteroplastic Cartilaginous Grafts (Recherches sur les greffes cartilagineuses hétéroplastiques). *Rev. de chir.*, 1916, li, 111.

The authors have made a systematic study of the value of heterogenous cartilage grafts from which they draw their conclusions. The fact common to all the operated who were examined after a long interval was very clearly seen to be a tendency toward a rapid softening of the graft. In the most marked cases this was accomplished almost within two months. Microscopic examination showed that the mechanism of this softening was in no way that of a sequestration, it was a biologic process. The graft quickly effected adhesions which enabled it to live; but, at the same time, it was actively attacked and progressively devoured by young cells which were mostly leucocytes. This process caused the disappearance of the essential characteristics of the graft and transformed it into fibrous tissue.

While the authors favor the use of cartilaginous grafts in the repair of facial defects, they do not think that they are efficacious in cranial defects, particularly hetero-grafts; and it may be deduced also that auto- or homo-grafts can equally, in certain circumstances, undergo a more or less complete degeneration.

W. A. BRENNAN.

Ransohoff, J.: Congenital Lipomata of the Cheek. *Ann. Surg.*, Phila., 1917, lxxv, 711.

Ransohoff presents two cases in which congenital lipomata were removed from the cheek. These spring from the sucking pad of fat beneath the buccinator. He gives a historical sketch of the discovery and rediscoveries of this latter structure up to the time when its true fatty nature was determined by Cichat in 1801. Tillan described this pad as follows: "Between the buccinator muscle and its aponeuroses there is a constant fat ball even in the most emaciated subjects. It corresponds to the anterior border of the ascending ramus of the jaw, in relation with the anterior border and a little on the inner surface of the masseter muscle which it separates from the buccinator. The cheek presents therefore two layers of fat, which are distinct from each other. The one superficial, subcutaneous above the fascia, the other deep seated and beneath the fascia."

The latter is the sucking pad and is sometimes encapsulated. It is from this that the congenital lipomata sprung.

Lipomata are the rarest of congenital tumors. When designating congenital lipomata, fat masses occurring in other congenital tumors must be excluded as in spina bifida, teratomata, chiefly about the sacrum and coccyx.

True congenital lipomata are associated with unusual development of fibrous and lymphangiomatous tissue.

K. L. VEHÉ.

Lilienthal, H.: A Method of Incising Parotid Abscess Without Injury to the Facial Nerve Distribution. *Am. J. Surg.*, 1917, xxxi, 101.

Instead of the long, painful wait for something to happen when suppuration has been recognized in the parotid gland, the author offers prompt relief by an incision, which he claims permits of free drainage and the avoidance of unsightly scars as

well as injury to the important branches of the facial nerve.

The description of his method is as follows, although modifications, he believes, will occur to the surgeon according to the requirements of the case: A vertical, skin deep incision is made in front of the auricle and just as close to it as possible; this incision is extended to the hollow behind the angle of the jaw and thence in a gentle curve forward as far as the projection of the anterior border of the masseter muscle; the flap of skin thus formed is reflected forward, revealing the greater part of the parotid gland with its overlying fat and fascia. The incisions, as many as are necessary for drainage, may now be made through the parotid fascia into the gland itself, the line radiating in a general way along the course of the pes anserinus. No incision, however, should cross the line of Stenson's duct for fear of salivary fistula. Deeper collections of pus may be evacuated through this same cutaneous incision by puncturing through the fascia behind the ramus of the jaw and then enlarging the opening with the director and dressing forceps.

The opening into the parotid may be packed or otherwise drained, the skin-flap not being replaced until healing is well advanced, when it may be held in position with adhesive strips.

E. C. ROBITSHEK.

Blair, V. P.: Septic Parotitis. *Med. & Surg.*, 1917, i, 34.

In discussing the similarity of biliary duct disease and inflammation of the salivary ducts, the point is brought out that probably stone irritation and obstruction is the cause of the intermittent enlargements of the glands and that simple subacute or chronic inflammation without stone is not very common.

A case in which a probe could be passed to the bifurcation of the parotid ducts is cited, but at operation stones less than 2 mm. in diameter were found; these could not be seen in the X-ray nor could they be palpated. Stones in the parotid ducts are much more difficult to demonstrate than those in the submaxillary ducts.

While there are two theories of acute infection of the glands, especially in the parotid — (1) metastatic, (2) due to ascending infection of the excretory ducts — the author contends that neither has been demonstrated beyond dispute.

The treatment of acute septic parotitis is described in detail, special emphasis being placed on early radical operative procedure. Special stress is placed on extensive incision through the capsule, allowing the gland to expand, and exploration of the gland for pus, especially the prolongation that runs along the duct.

Of seven personal cases, reported in detail, two were of the mild type which recovered following incision and drainage. Five were severe infections, three of which recovered and two died of general sepsis.

Pont, A.: Rhinoplasty of the Lobe and Alea (Rhinoplastica del lobulo e delle ali). *Ann. di odont.*, Rome, 1916, i, 553.

In the case of a patient, the lobe and the greater part of the alæ of whose nose had been destroyed by an explosion, Pont had decided to use the Italian method of reparation, but was obliged to use the Indian method because the patient could not tolerate the arm immobilization apparatus, the use of which is necessary in the former method.

A horse-shoe shaped incision was made about 1 cm. above the defect so as to obtain a strip of tissue which was then lowered and sutured to a small cutaneous stump, the only remaining trace of the septum. The lower edge of the nostrils was thus constituted. The loss of substance which remained was filled with a flap cut from the forehead and accurately sutured with silk to the edge of the nostrils. The reconstituted lobe was naturally flat and lacking in projection and to correct this later Pont left the autoplasmic strip free from its point of attachment on the forehead as far as the defect in the nose. Later the upper part of the strip which formed an excess of tissue was cut and turned downward and forward so as to meet the edge of the previous frontal flap. The orifice of each nostril was maintained by rubber tubes. The result was perfect both esthetically and functionally.

W. A. BRENNAN.

Tilley, H.: Acute Osteomyelitis of the Frontal Bone; Operation; Recovery. *Brit. M. J.*, 1917, ii, 7.

A woman of 35 after an illness of 10 days from influenza developed pain, redness, and swelling about the left eye and frontal region and moderate fever. A diagnosis was made of inflammation of the frontal sinus and operation resorted to for drainage. Inspection then showed that the diploë of the frontal bone were full of pus indicating an osteomyelitis of the frontal bone. An abscess of the orbit and one of the left breast were evacuated one and three and one-half weeks later respectively, and about five weeks after the first operation an extensive incision was made over the left frontal bone which was largely necrotic and a large part of it removed. In two places, adherent dura and cortical brain substance came away with the dead bone. The patient's convalescence was interrupted five weeks later by a facial erysipelas but she ultimately made a complete recovery. C. A. HEDBLÖM.

Massobrio, G.: War Fractures of the Mandible and Their Surgical Treatment (Fratture di guerra della mandibola e loro trattamento chirurgico). *Policlin.*, Roma, 1917, xxiv, sez. *prat.*, 993.

The author thinks that displacement of the ascending branch of the mandible is especially grave and that its reduction is a problem not yet solved by many surgeons. The author is inclined to think that this could be effected by nail extension

applied precisely on the ascending branch of the mandible.

When there is loss of substance, it is best not to attempt grafting in the first instance but while the fragments are maintained in position to allow periosteal regeneration. The periosteum according to the author's observations can when its functions are not interfered with reproduce a large part of the lost bone, and a dental prosthesis only will finally be necessary. When such a regeneration fails it will then be time enough to resort to bone or cartilage grafts. This should be done as a late operation when all inflammatory reaction has ceased. The surgical treatment of mandibular fractures thus resolves itself into a first stage of mechanical prosthesis, and a later stage of bone substitution. In the author's opinion too little attention has been given to internal prosthetics.

W. A. BRENNAN.

Patel: Intracranial Foreign Bodies Situated in the Interhemispherical Zone (Corps étrangers intracrâniens situés dans la zone interhémisphérique). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1154.

Besides intracerebral projectiles there is a variety which are situated in the interhemispherical zone. Radiographically they may be distinguished by the proximity of their situation to the median line. The study of the different cases shows that such projectiles will be found in the side of the entry orifice. The mode of removal will be by paramedian trepanation not involving the cerebral substance. The author gives the technique of the operation and of the radiologic localization.

W. A. BRENNAN.

Mathieu, P.: Treatment of Craniocerebral Lesions Due to Gunshots (Traitement des lésions crâniocérébrales par projectiles de guerre). *Rev. de chir.*, 1916, li, 666.

Mathieu observed 71 craniocerebral war traumas, 13 of which reached the ambulance in a state of coma with large exposures. All died rapidly. Six severe irradiating fractures with cerebral contusion gave 1 death—16.6 per cent; 13 cranial injuries without dura mater involvement gave 100 per cent recoveries; 39 cranial injuries with dura mater lesion gave 15 deaths.

The gross mortality has been 38 per cent. In cases where the projectile has not been extracted the mortality is 71 per cent.

The general deductions drawn by Mathieu are that scalp wounds in war, no matter how slight, should be treated surgically. The surgical aim is to prevent meningo-encephalic infection by removing all foreign substances. The condition of the internal table must be verified when the external table shows a fissure or when there is some other important clinical sign. If the dura is intact it must be respected. If there is a projectile it should be extracted, if the intervention is anatom-

ically without danger; but the complete extraction of bone fragments is in every case the indispensable complement of intervention.

W. A. BRENNAN.

Teacher, J. H.: Two Cases of Subdural Hæmorrhage Due to Injury Without Fracture of the Skull. *Glasgow M. J.*, 1917, vi, 1.

The author reports two unusual cases of subdural hæmorrhage due to injury without fracture. The hæmorrhage in each case was due to tearing of a fibrous connection between the dura mater and the pia arachnoid near the bifurcation of the fissure of Sylvius and almost in the line of the middle meningeal artery. Bleeding took place from vessels on the surface of the brain and not from the middle meningeal artery.

The author's conclusions are as follows:

1. It was clear from the direction and microscopic examination that there was an adhesion between the dura mater and the pia arachnoid, and this had been ruptured, giving rise to hæmorrhage into the subdural space.

2. It is probable that the artery which was found hanging from the interior of the dura mater in this adhesion belonged to the sulcus of the brain, in and about which there was hæmorrhage, and that it had been torn and dragged out for a length of about half an inch from the pia arachnoid.

3. Sections disprove the theory that the vessel was related to the middle meningeal system of arteries.

C. A. BOWERS.

Claude, H., and L'Hermitte, I.: The Infundibular Syndrome in a Case of Tumor of the Third Ventricle (Le syndrome infundibulaire dans un cas de tumeur du troisième ventricule). *Presse. méd.*, 1917, p. 417.

Knowledge of the functions of the regions of the infundibulum and third ventricle is still very scant.

The clinical observation of a case which finally came to autopsy and showed a tumor limited to the lower part of the third ventricle and the infundibulum leads the authors to the conclusion that the clinical findings in man confirm the experimental findings in animals that lesions of the third ventricle region may be accompanied by sensory disturbances, deep disturbances of the circulation and of the mechanism of hydration in the tissues. The hypophysis does not directly share in these phenomena. The pituitary body and sella turcica seemed normal in this case.

W. A. BRENNAN.

Raventos: Sarcoma of the Cerebellum a Year After Intervention (Sarcoma del cerebelo al ans de la intervencion). *Terapia*, Barcelona, 1917, ix, 299.

In the case reported by Raventos the symptomatology manifested before operation was as follows: left hemiparesis, affected gait, hemiparesis of the tongue, hyperæsthesia with anæsthesia to touch, atrophic papillitis with venous congestion. The operation was in two stages. In the first stage

under general anæsthetic the osteocutaneous tissues were widely incised in the form of an inverted "U" the chisel being employed. By intervening in two stages hæmorrhage is avoided and the expenditure of organic energy limited. The wound is cicatrized by the ninth day. Fifteen days later the second stage of the operation was proceeded with under local anæsthesia. In the lower face of the cerebellum under the middle lobe a tumor had penetrated and was embedded for 3 cm. This was circumscribed and enucleated. Histologically the tumor was found to be a sarcoma. After intervention there was a constant flow of spinal fluid which ceased only with cicatrization. The compression phenomena disappeared. The condition one year later showed the gait still affected, lateral nystagmus, left-sided hemiparesis, no vertigo, and diminished headache. The papillitis was cured. Consolidation of the bony breach was not established. There was a hernia of cephalorachidian fluid. The author considers this fistula to be advantageous as facilitating access in case reoperation for recurrence is necessary.

W. A. BRENNAN.

Alhaique, A.: Cerebral Compression Due to Meningeal Hæmorrhage, Curative Effects of Repeated Lumbar Punctures (Compressione cerebrale da emorragia della meningea; effetti curative delle punture lombari ripetute). *Policlin.*, Roma, 1917, xxiv, sez. prat., 801.

Clinical histories of two cases of intercranial hæmorrhage due to rupture of the meninges are given. In one case there was a contusion of the right temporal region and in the other there was a left temporal wound due to a shell fragment. Both cases were treated and cured by repeated lumbar punctures. The author concludes as follows:

1. Ruptures of the meningeal artery give a smaller percentage of mortality than is generally believed.

2. Where the compression phenomena become aggravated very early, intervention is called for, yet after a day or two it is permissible to abstain even if the compression phenomena persist since the wound or concomitant fracture or a local infection do not favor operation.

3. In such cases of intercranial hæmorrhage ample repeated lumbar punctures are efficacious and definitely beneficial.

W. A. BRENNAN.

Ransohoff, J.: Some Observations on Brain Surgery. *Interst. M. J.*, 1917, xxiv, 343.

The first step of brain surgery — trephining — is older than written history, but real work in this branch of medicine is less than fifty years old. Trephining *per se* is practically without risk, but the later development of paralysis, spurious meningocoele, epilepsy, and abscess are always to be considered. To the general surgeon, fractures with their concomitant brain injuries will always constitute the majority of cases in which operation is

indicated. Here X-ray gives an assured estimate as to the damage to the skull, while a lumbar puncture will give an idea of the damage to the brain. Many basal skull fractures are doomed from the moment of the accident. In about 200 cases seen in the Cincinnati General Hospital, 37 per cent of the deaths occurred in less than six hours, and 56 per cent in the first twelve hours. The author can recall but two cases in which he believes that an operation foiled death in cases which appeared hopeless. In cases living longer, a spinal puncture will often accomplish all that a decompression will, and is destined to take its place in many instances, as it relieves the œdema when the bleeding has stopped. Decompression is indicated in all cases in which the patients become progressively or suddenly worse, showing signs of increased intracranial pressure. The rule that localizable brain injuries with fracture should be operated upon stands.

From experience along the western front in the present European War, it appears that the brain substance is not easily, or rapidly infected. The consensus of opinion of the war surgeons is that none but the simplest operations should be done except at a base hospital. If a trephining is to be done, it should be some distance from the injury, and the latter, if not too large, excised. Gauze drainage is to be entirely avoided, and where drainage is absolutely necessary, it should be done with gutta-percha or strands of silkworm. Primary union is to be sought for here as elsewhere.

A great many brain abscesses are best treated by the otologist. There are a number of cases of this type, however, coming to the general surgeon. While the results are more favorable than formerly, they are still anything but encouraging, and the patient is often left with hemiplegia, the subject of convulsions or of mental defects.

Brain tumors as nothing else tax the diagnostic acumen of the surgeon. In only 40 per cent of the cases is the tumor found at operation. This is due to the silent process in some instances, and the localizing symptoms, if present, are slight and difficult of clear interpretation. Gliomata often so resemble the normal brain substance that although perfectly exposed they may not be recognized. Of the three subcortical tumors that the author has been able to remove, two died of a recurrence within a year. The mortality from operation is high, although Cushing reports 136 operations with only four deaths. Operations upon the cerebellum which were considered unjustifiable a little over a decade ago have been made quite as safe as pretentorial tumor operations, due partly to the fact that a large proportion of these tumors have turned out to be cysts requiring only drainage, and partly because decompression promptly relieves the most distressing symptoms. Deaths due to respiratory failure must not be forgotten in this type of cases.

Right temporal decompressions as a routine are bad practice, for in cerebellar growths death may

occur from dislocation of the brain stem, just as it occurs occasionally in the reverse direction from spinal puncture. McGuire's method of removing a large bone-flap over the occiput appeals to the author.

In regard to epilepsy of idiopathic origin, the results are not promising enough to warrant surgical procedure, although this seems to be a more logical point of attack than the short-circuiting operation of the intestine or the removal of the ovaries as formerly and still occasionally practiced.

GATEWOOD.

Futcher, T. B.: Acromegaly. *Med. Clin.*, North America, 1917, i, 131.

The patient was a woman 67 years of age who complained mostly of intense frontal headache. She also had pain in the right lumbar region and a peculiar feeling in the chest. The physical ex-

amination, which is given in detail, showed the characteristics of the disease as did the roentgenograms of the skull and hands.

Futcher gives D. N. Paton's classification of the various endocrine glands from an embryologic standpoint. The interrelationship of the ductless glands is summarized, and the anatomy and functions of the pituitary gland are given. Cushing's 5 groups of dyspituitarism are outlined. The treatment of acromegaly is both medical and surgical according to Futcher. The surgical consists in the removal of the diseased gland or of any neighboring tumor pressing upon the gland. The medical care consists in organotherapy which should always be used following hypophysectomy. Each case individually must have the dosage of the posterior lobe extract worked out. The extract may be given by mouth, subcutaneously or intravenously.

CARL R. STEINKE.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Delore, X., and Arnaud, L.: Treatment of Penetrating Gunshot Wounds of the Chest (*Traitement des plaies pénétrantes de poitrine par projectiles de guerre*). *Lyon chir.*, 1917, xiv, 280.

The authors treated and followed 71 penetrating chest wounds with 46 recoveries and 25 deaths. Of the 71 injuries 18 were due to rifle bullets, 5 to shrapnel balls, and 48 were shell wounds, 15 of the deaths being due to the last.

Regarding the treatment of such wounds the authors recommend the following treatment:

1. For punctiform wounds, medical treatment only: complete immobilization of the chest, large doses of morphine—3 to 4 centigrams daily. These wounds due to rifle bullets are not usually infected and are rarely associated with severe vascular lesions. But if the bullet wound shows any symptoms of abdominal penetration then immediate operation is necessary and the authors prefer an abdominal operation. Contraction of the abdominal wall as a single symptom does not authorize a laparotomy as it often exists when the wound is confined to the chest alone.

2. For large wounds the authors advise operation as early as possible even if the man is severely shocked. The procedure after X-ray examination is:

- a. A parietal wound is widely opened up and thoroughly cleansed, all foreign bodies, pieces of ribs and manubrium removed and the remaining bone surfaces smoothed; the injured soft parts are cut away. After careful hæmostasis if the projectile has not penetrated the lung the pleura is cleansed, sutured if lacerated, and wound dressed.

- b. If the projectile has penetrated the lung, the gap is enlarged, any blood found in the pleural cavity

is removed, and the pleural sinuses, lung, and diaphragm thoroughly examined. It is useful to operate under the radioscopic screen. The lung may be drawn out of the wound if the projectile is situated deeply; and if not clinically infected nor too much lacerated it may be sutured as well as the pleura. If not, the edges of the lung wound must be fixed to the wound of the skin by some catgut stitches to avoid a later retraction.

- c. If there is a wound of the diaphragm it is enlarged sufficiently to explore the liver or spleen. If the latter is injured, its removal through the gap is easy. A wound of the upper surface of the liver may be plugged with a gauze tampon.

- d. If other abdominal organs appear to be injured, a complementary laparotomy will be necessary after closure of the diaphragm wound. Even in those cases where abdominal symptoms predominate the authors begin the operation by the treatment of the chest wound which often avoids a laparotomy and at all events prevents all secondary complications from the pleura or the lung.

W. A. BRENNAN.

Hartmann: Is Thoracotomy Indicated in the Treatment of Wounds of the Chest to Arrest Hæmorrhage (*La thoracotomie est-elle indiquée dans le traitement des plaies de poitrine pour arrêter les hémorrhagies?*) *Bull. et mem. Soc. de chir. de Par.*, 1917, xliii, 404.

Hartmann takes exception to a recent recommendation of Duval favoring early thoracotomy in the case of chest wounds with extensive hæmorrhage. From inquiries made of several of the automobile surgical ambulance services, Hartmann finds that in cases where thoracotomy is not done the mortality varies from 12.7 to 18 per cent, which is the same percentage reported by Duval with thoracot-

omy. Moreover, no report is given of any patient dying from hæmorrhage in the statistics gathered by Hartmann. He is therefore of the opinion that thoracotomy, as a preliminary to hæmostasis of the lung, although theoretically rational, is not indicated.

DUVAL, in the discussion brought forward some additional cases to those included in his first report, making the mortality of all his cases 32.1 and the recoveries 67.9 per cent. He reiterated that in severe hæmorrhages thoracotomy with suture of the lung saves two-thirds of the patients.

W. A. BRENNAN.

Pilcher, P. M., and L. S.: The Result of Operations for Tumors of the Breast, Benign and Malignant, with Critique on Technique. *Ann. Surg.*, Phila., 1917, lxx, 654.

From experiences gained from supposedly benign tumors of the breast, the authors conclude that it is logical to recommend the removal of the diseased tissue in every case when a surgeon of experience cannot say with reasonable certainty that the case is one of non-progressive cystic or inflammatory induration. They deplore the habit of some surgeons of watching a doubtful lesion for a time, as the patient or the doctor readily forgets the appointed time, only to find later a malignant tumor defying removal. They believe that more cases which should be operated upon are refused early operation on account of the conservatism of the surgeon than there are cases operated upon which do not require surgical interference.

From a review of their statistics the authors conclude that owing to the frequency of supraclavicular glands in tumors of the upper quadrants, every advanced case should have the benefit of axillary and supraclavicular dissections as a part of the primary operation. The authors have had three cases in which it was necessary to remove both breasts and dissect out the axillæ and supraclavicular spaces with complete freedom from recurrence over ten years after the first operation.

The incision used by the authors resembles closely that of Handley. It has for its purpose the complete removal of all of the diseased tissue, the avoidance of implantation, the interruption of possible progressive metastases by the routine removal of the first chain of lymph-nodes draining from the area in which the primary focus lies, and the use of incisions in the primary steps of the operation which will facilitate the formation of plastic flaps to cover the raw area. The authors complete the axillary dissection before completing the removal of the breast. They use an undulating incision in the axilla with its convexity approaching the posterior axillary fold. While the peculiarities of the individual case must govern the incision to a large extent, as the incision advances upon the front of the chest, the curve is reversed. The inner end of the incision follows the margin of the breast to the epigastrium joining the outer incision which begins

in the epigastrium and extends up along the lower and outer border of the breast until it meets the primary incision at the base of the axilla. By undermining it is possible with a little skill to close the majority of cases by suture. GATEWOOD.

Sherrill, J. G.: Clinical Observations on Mammary Neoplasms. *Internal. J. Surg.*, 1917, xxx, 226.

About 80 per cent of mammary neoplasms are malignant. The laity consider cancer a hopeless disease and there is a tendency to conceal the fact of its presence.

Factors which cause delay in applying to the surgeon are: (1) ignorance of the presence of the mass; (2) timidity and ignorance of the patient; (3) inattention on the part of the physician; and (4) the erroneous impression that cancer is hopeless.

Sherrill emphasizes the need for a simpler classification and suggests the following: (1) cysts, (2) tumors—(a) benign, (b) malignant.

While not admitting the correctness of McCarty (Rochester) in his classification and contention that the finding of cellular hyperplasia is the deciding factor, the author says that if proven it will do much toward simplifying the study of these tumors.

He does not believe in taking frozen sections at the time of operation except where there is a reasonable doubt as to the correctness of the diagnosis, because there is danger of contamination, and several sections may be necessary because of the existence of benign and malignant lesions in the same breast.

Early diagnosis is of vital importance. The facts to be considered are:

1. Careful anamnesis.
2. Inspection of both breasts.
3. Palpation by placing the palm of the hand flat upon the breast and gently pressing the gland against the chest wall.

Characteristics of benign enlargements are:

1. They occur at any age, often in the young.
2. Slowness of growth.
3. Encapsulated and not infiltrating.
4. Mobile or fascia and under the skin.
5. Absence of glandular enlargement.
6. Usually painless except in neuralgia.
7. Most often occur in nulliparous women.
8. No retraction of nipple.

Characteristics of malignancy:

1. Occurs usually after the age of thirty.
2. The mass grows slowly and constantly if carcinoma; rapidly and spasmodically if sarcoma.
3. Carcinoma is not encapsulated and soon infiltrates; sarcoma is encapsulated at first and later infiltrates.
4. There is early attachment to the skin and fascia.
5. There is early glandular involvement.
6. Pain is not an early but a late symptom.
7. It usually occurs in women who have borne children.
8. There is retraction of the nipple.

The irregular outline and induration gradually merging into surrounding tissue is characteristic of scirrhus.

The author emphasizes the necessity of making a correct pathological diagnosis in order to make a true prognosis.

He advocates the Warren incision for benign growths. In radical operation he removes the axillary glands first and then the breast proper together with the pectoralis major muscle. Sometimes he leaves a few fibers of this muscle above the range of the lymphatics to secure greater mobility of the arm.

In his experience he has not had a local recurrence during the past ten years. The irritation of slow healing from separation of skin margins may favor recurrence. Nearly all his recurrences have been visceral. If radiography shows shadows cast by the mediastinal glands operation should be abandoned. Roentgentherapy either before or after operation is advocated.

C. A. BOWERS.

Policard, A., and Desplas, B.: The Evolution of Traumatic Hæmothorax (L'évolution des hémithorax traumatiques). *Lyon chir.*, 1917, xiv, 240.

In April, 1916, the authors made a preliminary report of the results of a series of observations concerning the cellular constitution of traumatic sanguinary effusions. The present report is a developed account of their researches. They are based on 25 cases of hæmothorax submitted to a daily cytological examination until complete recovery, and on some cases of infected hæmothorax.

The authors find that the evolutions of traumatic hæmothorax toward recovery pass constantly through different phases which are clearly indicated by the variations in the cell content and cell quality in the effusion. Samples of the effusion must be taken and microscopically examined at least every two days.

From the third to the fifth day the smears show an increasing quantity of neutrophiles, the proportion of which in cases with a good prognosis does not exceed 50 per cent, which ought to be the maximum about the third day. An abundance of mononuclear leucocytes, 25 to 40 per cent endothelial cells, also denotes a good prognosis. If the number of neutrophiles is increasing instead of diminishing after the third day, it indicates an imminent septic transformation of the hæmothorax and precedes any clinical sign.

About the twelfth day of normal evolution the effusion shows:

1. A small number of cells.
2. A certain number of eosinophiles, the greater the number, the better the prognosis.
3. A few polynuclear neutrophiles, 25 to 30 per cent at the most.
4. The presence of a large number of lymphocytes and young endothelial cells indicates the beginning of a cellular organization of the fluid.

The authors think that the regular bacteriological examination of the hæmothorax fluid gives very valuable indications as regards the prognosis as well as of the necessity of early surgical intervention in infected cases.

W. A. BRENNAN.

Tuffier: Treatment of Pleural Suppurations (Traitement des suppurations de la plèvre). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 16.

In previous reports Tuffier has referred to the method of treating pleural suppurations by careful disinfection of the pleura with Dakin's or other disinfecting fluids and when disinfection is complete closing the surgical orifice. In other words, "the treatment is a transformation of a pyothorax into a pneumothorax which cures spontaneously. In his previous reports Tuffier included only chronic suppurations. In the present report Tuffier deals with recent pleural suppurations. Of these there have been 22, of which 12 were medical purulent pleurisies and 10 suppurative hæmothorax cases. Of these cases 7 have been closed and are completely cured; 15 are still under treatment or only a short time closed.

In comparing the functional results obtained in recent suppurations with those obtained in long established suppurations the conclusion is arrived at that as a general rule recent suppurations are easy to sterilize and cure. And seeing that it is so, there ought in future, save very exceptionally, be no cases of chronic empyema. It should suffice to treat medical or surgical purulent pleurisies by sterilization, according to Dakin's or other methods, so as in a short time to be able to close the surgical aperture and effect permanent recovery. After costal resections the retracted lung loses a large part of its functional value. On the contrary after sterilization and early closure of the pleural incision there is little cavity deformation, the lung resumes its permeability and its functions approach the normal. Such verified facts denote real progress in the treatment of intrapleural suppurations.

W. A. BRENNAN.

Patel and Papillon: Foreign Bodies of the Mediastinum (Corps étrangers du médiastin). *Lyon chir.*, 1917, xiv, 413.

The authors give the clinical histories of 10 cases of projectiles situated in the mediastinum. Of these 6 were in the anterior and 4 in the posterior mediastinum. The immediate symptoms are those common to all intrathoracic foreign bodies. Hæmoptysis occurred only three times, once associated with hæmothorax. As a rule there are no secondary symptoms, as foreign bodies situated in the mediastinum give less trouble than those in the diaphragm. Pain was observed in three cases.

The X-ray examination is very important. Radioscopy and radiographic plates are made in front, profile, and oblique positions to exactly determine the distance of the projectile and its relations to the chest, as well as its mobility or immobility.

The operative indications are given by the dangerous proximity of the heart or large vessels. The authors believe that the extraction of foreign bodies from the anterior mediastinum offers no risk to the patient's life; but that extraction of bodies situated in the posterior mediastinum offers very great difficulty and danger and attempts often have to be abandoned.

As regards the technique of extraction, the authors prefer an extrapleural route in the case of foreign bodies in the anterior mediastinum. In the upper part down to the second rib they recommend a cervical incision with or without a sternoclavicular resection. In the middle part simple incision of an intercostal space is not sufficient for deep-seated projectiles and a sternochondrocostal resection is often necessary; in the lower part the substernal route can be used. If these measures do not expose a sufficiently wide operative field, a transpleural operation after the resection of several ribs, or after the preparation of a temporary flap, may be advisable.

For deep or low-seated projectiles of the posterior mediastinum, the anterior transpleural operation is almost always the only possible one; a posterior incision and extrapleural method only affording access to the upper part of the mediastinum or to the middle part if the projectile is lodged near a rib.

A. W. BRENNAN.

Hamman, L.: Dermoid Cyst of the Mediastinum.
Med. Clin., North America, 1917, i, 177.

The patient, a white male, 30 years of age, was complaining of cough and expectoration. The family and previous histories were negative as to the present condition. In 1910 he had pneumonia on the right side with full recovery. He had another attack in 1911 and again in 1913. The third time he coughed up a large amount of green fluid mixed with blood. A diagnosis of pulmonary tuberculosis was made and he was sent west. During the eight months at the sanitarium he had a number of hæmoptyses but tubercle bacilli never were found in the sputum. Upon his return in 1912 Hamman's examination gave the following impression: "The physical examination gives the impression of there being a mass in the mediastinum pushing out to the left and compressing the lung, rather than of a disease of the lung itself. The principal possibilities are a mediastinal abscess or a dermoid cyst which has ruptured into the bronchus." The sputum showed small bits of elastic tissue but no tubercle bacilli. Bronchoscopic examination showed a thick purulent discharge coming from the first branch of the left bronchus and no pus from any point below this opening. The Wassermann reaction was negative. The temperature during the two weeks he was in the hospital ranged from 98° in the morning to 101° in the evening. No definite diagnosis was made. He did not look very ill and the general examination gave nothing of importance except the chest findings. During the three

years following he had severe hæmoptyses. In March, 1916, he noticed for the first time a few hairs in the sputum, and since then has found hairs in the sputum several times. His weight increased. The prognosis is always grave and the treatment is surgical. Hamman refers to two summaries of similar cases in the literature. CARL R. STEINKE.

TRACHEA AND LUNGS

Moore, A. B.: The Roentgen Diagnosis of Non-tuberculous Diseases of the Lungs. *J.-Lancet, 1917, xxxvii, 430.*

Non-tuberculous diseases of the lung by roentgen diagnosis are classified as: (1) malignant — primary, secondary, (2) inflammatory.

1. Malignant — Primary: (a) infiltrative form — massive shadow around roots of the hilum without adjacent inflammatory evidence, usually monolateral; (b) miliary form — multiple discrete areas, increased density both lungs, no tendency toward cavity; (c) mixed form — resembles both infiltrative and miliary, commonest type.

Secondary (71 cases). Order of primary focus: (1) breast, (2) thyroid, (3) grouped — kidney, soft tissue of arm, leg, or thigh, lip, testes, bowel, stomach. Roentgenographically (58 diagnosed) — circumscribed nodules, no inflammatory wall, and no fimbriated edges, usually multiple situated nearer the bases than the apices and no tendency to cavity.

2. Inflammatory (non-tuberculous): (a) bronchitis — infiltrative type, cylindrical type, sacculated type, represent different stages of the disease; (b) bronchiectasis; (c) lung abscesses.

(a) Bronchitis by roentgenogram — fine string-like shadow along course of main bronchi, radiate out from hilum but do not reach periphery of chest, and vary in density with the degree of congestion. The infiltrative type is characterized by definite peribronchial increase in density, usually lower lobes extending toward the periphery and obliterating the costophrenic angle. The cylindrical type resembles the infiltrative and numerous small pseudocavitations. Sacculated type — multiple large pseudocavitations separated by fibrous tissue.

(b) Bronchiectasis — nothing said.

(c) Lung abscess — large area of increased density if filled or decreased density if emptied — a fluid level may be noted — an inflammatory zone surrounding.

HENRY VAN DEN BERG.

Phemister, D. B.: Chronic Lung Abscess with Pulmonary Hypertrophic Osteo-Arthropathy.
Surg. Clin., Chicago, 1917, i, 381.

The author reports a case of chronic lung abscess, of one and one-half year's standing in a man thirty-two years old. Numerous sputum examinations failed to reveal tubercle bacilli. His temperature ranged from 99° a.m. to 100 and 102° p.m. He lost 48 pounds in weight, and complained of pain in the right side, weakness, and profuse expectoration of

foul-smelling material, four or five sputum cupfuls in twenty-four hours. His extremities were emaciated together with marked clubbing of the fingers and toes with extreme curvature of the nails; chest showed dullness extending from the third to the eighth ribs posteriorly and from the second to the fifth anteriorly. Vocal fremitus was noted and the breath sounds were diminished. His breathing was high pitched and feeble. There were signs of obliteration of the pleural cavity, with no respiratory excursion at any of the lung borders. Roentgenogram showed a heavy shadow of the same density throughout.

Radiograms of the extremities showed a layer of periosteal bony thickening along the shafts of the tibia, fibula, radius, ulna, metacarpals, and metatarsus. The phalanges showed no bony changes, the clubbing being due to thickening of the soft parts.

The relation between the lung abscess and the bony changes was probably due to two factors: (1) chronic toxæmia, (2) circulatory disturbances.

Similar infections outside of the thorax rarely cause these changes. The order of importance of causes:

1. Chronic lung abscess.
2. Bronchiectasis.
3. Pulmonary tuberculosis with cavity.
4. Chronic empyema.

Cultures in this case showed bacillus amuliformans, streptococcus viridens, and a hæmolytic streptococcus.

The operation consisted in drainage under local anæsthesia, followed by resection of the fifth rib (the author believes that the seventh would have been better and given more dependent drainage); opening of the abscess with the Pacquelin cautery; insertion of a drainage tube. In following this method if the wound does not heal after primary operation it might be well to try bismuth paste or a decompressing operation, preferably the Friedrich.

C. A. BOWERS.

Dévic, E., and Cordier, V.: Remote Symptoms of War Injuries of the Lung (Symptômes éloignés des plaies de guerre du poumon). *Lyon chir.*, 1917, xiv, 254.

The authors' report is based on the observation of 950 lung wounds during 18 months and especially on 97 healed cases, which had no surgical complication, such as suppuration, empyema, abscess, or fistula. The study shows that the remote symptoms are rather identical whether the projectile was removed or left *in situ* or if it only made a perforation.

The remote pleural symptoms consist of pleural adhesions provoking limitations of the diaphragmatic movements and a relative immobility of the thorax.

The remote pulmonary symptoms may be:

1. Hypertrophy of the tracheobronchial glands — very rarely observed radioscopically.

2. Partial sclerosis of the lung, which may be discovered radioscopically without giving any clinical symptoms.

3. Limited chronic pneumonia giving the same clinical symptoms as an attenuated pneumonia in Bright's disease, except the expectoration which is very characteristic.

4. Emphysema of the lung which may occur whether the projectile is removed or not.

5. Late hæmoptysis which is rare.

The remote functional troubles are pain, dyspnœa, cough, and certain reflexes such as tachycardia. The evolution and degree of these symptoms depend on the irritability of the patient's nervous system.

The indications for late operations are very rare. The existence of a chronic pneumonia surrounding a projectile left in the lung is an absolute indication for intervention, but it is safer to await a period of remission. A limited sclerosis surrounding a projectile may also be an indication for intervention as it is sometimes the starting point of an abscess or of pneumonia. Other symptoms such as adenopathies or adhesive do not call for operation. A projectile well tolerated may be left in the lung without any danger, because the same final symptoms are observed whether the projectile is removed or left. The authors do not believe that such sequelæ or the presence of a projectile, give rise to a future tuberculosis.

W. A. BRENNAN.

Barnsby, H.: The Immediate Surgical Treatment of Lung Wounds (A propos du traitement chirurgical immédiat des plaies du poumon). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1534.

Barnsby reports four cases of pulmonary shell wounds treated by primary thoracotomy. The anæsthetic was ether, with closed thorax, the result sought being extraction of the projectile and costal fragments, suture of the lung and cleansing of the pleura. In the four cases the hæmothorax was evacuated and in two cases the lung suture was realized, it being unnecessary or impossible in the other two. In studying these cases the following points were noted:

1. Ether anæsthesia is admirably tolerated in these thoracic cases.

2. The extraordinary facility with which those severely wounded support this laparotomy of the thorax even more so than that of the abdomen.

3. The advantage of anterolateral thoracotomy with wide definitive or temporary resection of the fourth rib which permits the lung to be well seen and quickly sutured.

4. The frequency of costal interpulmonary splinters and free pleura.

5. The necessity of primary suture if the operation is done within five hours of injury, if everything looks well and the pulmonary wound is correctly repaired.

6. The advantage which would perhaps result from drainage of the pleura if the operation is made

twelve hours or more after injury, and if it is impossible to make a staunch suture of the lung.

Barnsby believes that primary thoracotomy as an immediate treatment of lung wounds which has been advocated and championed by Duval, is an excellent operation which under certain circumstances saves men destined to a sure death. Apart from cases of open thorax it is the operation of choice. It is applicable to all severe cases with closed thorax.

The class of wounded treated are those which very often die if there is abstention and make statistics look gloomy. The operation does not save all but it lowers mortality. W. A. BRENNAN.

Barraquer, M. M.: The Collapse Treatment of Lung Disease (Concepto sobre la colapsoterapia pulmoner). *Therapia*, Barcelona, 1917, ix, 257.

The author treated 9 cases of lung tuberculosis, 4 with fusion and 5 cavitary, also two cases of serofibrinous pleurisy, by pneumothorax according to Foralini's method.

His results as well as the results secured by other authors are given in an extensive table.

The following conclusions are drawn:

1. Pneumothorax contributes to the alleviation of and sometimes is a strong weapon against tuberculous intoxication.

2. When its indication is quite clear pneumothorax may give a favorable result; but if the indication fails, owing to some false assumption, a sharp rebuff and the destructive progress of the tuberculous infection results.

3. Pneumothorax is not an absolutely harmless procedure, since there is always the possibility of grave accidents which may deter the patient and the physician.

4. In serofibrinous pleurisy pneumothorax is of great value. W. A. BRENNAN.

HEART AND VASCULAR SYSTEM

Summers, J. E.: Cardiolytic—a Further Report, with Notes upon an Additional Case. *Surg., Gynec. & Obst.*, 1917, xxv, 92.

Cardiolytic, the removal of sections of the ribs which imprison the heart, in cases of extensive, adhesive mediastinopericarditis, was first performed at the suggestion of Brauer, in 1902. Its object is to untether the heart and provide a soft, elastic covering in place of the unyielding chest wall. These cases are progressively and necessarily fatal, because it is only a question of a comparatively short time, with all the distressing symptoms accompanying the damming back (*Verdaunungserscheinungen*), until the heart muscle wears out. The operation is not dangerous, and if performed sufficiently early, before the heart muscle is weakened, it, without doubt, will be of benefit; it will at least prolong life for considerable periods, years, in fact. The best time to operate is when the apex

tug, and the diastolic shock, and Broadbent's sign are strikingly characteristic, because these symptoms indicate the struggle of a strong heart muscle. These signs fade as the tone of the heart muscle weakens; they are the indices for prompt operation. In order that a soft, movable, musculocutaneous covering of the heart may take the place of the bony chest wall, it is advisable in removing the ribs, that all their periosteal covering should go with them. The danger of collapse of the lung from accidental injury to the pleura in carrying out this technique, is an imaginary one; the lung does not collapse. The pleural wounds are easily sutured after temporary occlusion with gauze sponges. The heart muscle in both cases reported by the author, was in an advanced degenerated condition, almost hopelessly so. Notwithstanding this, one patient, a man, lived four years and ten months; was able during this period to earn his living, and was almost free from heart symptoms until the last several months of his life. It is suggested that he might have lived much longer, because of the fact that he was subject to frequent attacks of mild tonsillar infection, during which periods it was noted that the heart always sympathized in such a way as to indicate that its extreme, almost necrotic degeneration, evidenced microscopically, had possibly been influenced to this degree by the tonsillar infection.

The second patient lived nearly a year after operation. She had symptomatically made a recovery in so far as the function of the heart was concerned, being able to drive a large automobile from Omaha to Denver, 600 miles, across the Rocky Mountains, and travel to a height of 12,000 feet without discomfort. However, overstrain in attempting to do several women's work upon a ranch, brought about an attack of decompensation which proved fatal. Had this patient's temperament permitted of the following of moderate exercise, as advised by her physician, in the author's opinion, she would undoubtedly be alive today.

The author, so far as he knows, is the only surgeon in this country who has been sufficiently interested in cardiolytic to perform this operation, at least to tell about what he has done.

Cardiolytic is a valuable operation, as has been proved by the operations, 38 in all, which have been done abroad, chiefly in France, Germany and England.

Davis, C. B.: Suppurative Pericarditis. *Surg. Clin.*, Chicago, 1917, i, 375.

The author describes a very interesting case of suppurative pericarditis, up to one year after operation.

The patient, a boy of ten, had successively osteomyelitis of the fifth metatarsal of the left foot, left tibia, left humerus, right fibula, lower end of the left femur, upper end of the right femur and right radius—all lesions opened and drained. Improvement was noted after each operation.

One month after operation the temperature and pulse remained high in spite of good drainage; white blood count 20,000, slight cyanosis, respiratory distress and general discomfort about the chest, temperature 101°, pulse 136, respiration 40. Heart dullness extended from the left axillary line to one and a half inches to the right of the sternum. The upper margin extended to the second interspace. The apex beat was not palpable, the liver margin was one inch above the anterior superior iliac spine. Radiographic examination showed ballooning of the pericardium, especially about the base of the heart, appearing to occupy about one-half of the thoracic cavity. On these signs and symptoms a diagnosis of purulent pericarditis was made.

Operation was performed under ether anaesthesia. On passing the needle close to the sternum in the fifth interspace, pus was found. The fourth and fifth costal cartilages were resected, the pleura pushed outward, the pericardium exposed, and artery forceps pushed in the sac at the side of the needle. A large amount of pus was allowed to escape slowly. A soft rubber drainage tube was sutured in and drainage was continued for several weeks. Cultures showed staphylococcus aureus in all lesions. The symptoms all improved.

One year afterward the following evidences of adhesive pericarditis were noted:

1. Systolic retraction of pericardium.
2. Systolic tug laterally and posteriorly.
3. Failure of absolute cardiac dullness to change on deep inspiration.
4. Absence of excursion of lower border of the left lung.

The ultimate prognosis is unfavorable, especially in young children. Ten cases are beyond the age of puberty. There are adhesions between the parietal and visceral pericardium, and adhesions of the outer layer to the mediastinal structure, to the sternum and spinal column, which result in death of the patient from exhaustion.

The usual clinical findings are:

1. Development of pericardial distention to the limit of elasticity of the sac with resultant cardiac depression.
2. Heart in the anterior position held forward against the pericardium by exudate.
3. A portion of the right border of the left pleura is variable so there is danger in aspiration of the pericardium for treatment or diagnosis due to infection of the pleural cavity.

Free drainage must be established or the prognosis is almost hopeless where only aspiration is done. The mortality rate is about 50 per cent with direct incision.

The methods of operation are:

1. Resection of the fourth or fifth or both costal cartilages and exposure and incision of the pericardium.
2. Incision parallel to the under border of the seventh cartilage, resection, and exposure of the pericardium.

C. A. BOWERS.

Dujarier: Removal of an Intracardiac Projectile Followed by Recovery (Ablation d'un projectile intracardiaque suivie de guérison). *Bull. et mem. Soc. de chir. de Par.*, 1917, xliii, 1413.

The author removed a piece of shell measuring 20 mm. by 7 mm. which was situated in the interior of the right ventricle.

Radioscopy showed a subdiaphragmatic projectile moving synchronously with the heart and projected in the internal wall of the fifth left intercostal space. After cutting a cutaneomuscular flap the fifth, sixth, and seventh left costal cartilages were resected and also a part of the sternal edge. The pleural cul-de-sac was found but not opened. The pericardium was incised and pericardial adhesions removed with the finger. The projectile could be felt in the heart. There was a large fibrous cicatrix on the inferior face of the right ventricle. The projectile was mobile. A fold was made at the edge of the heart into which the projectile was pushed and clamped by the fingers. The anterior wall was then incised and the projectile removed. The clamping fingers assured hæmostasis. Some catgut sutures were placed with a curved needle and the heart replaced. There was no leakage. The operative wounds were then attended to. The pulse before operation was 100; immediately after, 88. There were some complications during convalescence, a suppuration of the interior of the wound and some pulmonary troubles in the trajectory of the projectile. The patient, however, is mending rapidly.

W. A. BRENNAN.

PHARYNX AND OESOPHAGUS

Bevan, A. D.: Pulsion Diverticulum of the Oesophagus—Cure by the Sippy-Bevan Operation. *Surg. Clin.*, Chicago, 1917, i, 449.

The author reports a case of pulsion diverticulum of the oesophagus. He describes the mechanics of their production, the signs and symptoms of oesophageal diverticulum, the danger of confusing with stricture and how to differentiate. The treatment is given in detail.

A long incision is made over the sternocleidomastoid of the left side from the clavicle to the angle of the jaw. The sternocleidomastoid is drawn to the outer side and the omohyoid muscle divided between two clamps. The inferior thyroid artery is clamped at two points, divided, and each of the cut ends ligated. With a blunt retractor the carotid artery and internal jugular vein are carried laterally and the upper part of the oesophagus exposed. With a blunt dissecting forceps the upper part of the diverticulum is picked up, great care being exercised not to rupture it. Arming the fingers with a piece of gauze, this large sac is gradually drawn up out of the thoracic cavity and into the field. This dissection has to be made very carefully and it has required fully eight or ten minutes to free the sac and bring it completely out of the wound.

In order to avoid opening the sac, it is obliterated by a series of purse-string sutures. For this purpose the linen used should be vaselined so that it will run more smoothly in the tissues and lessen the risk of tearing through the sac. The sac is invaginated into itself and the œsophagus. In the case mentioned four purse-string sutures were used, the first three being of linen and the last one of iodine gut. This was done because the three linen sutures will be passed into the œsophagus eventually and the last purse-string suture of iodine gut will, of course, be absorbed and produce a firmer cicatrix. Depending upon the size of the

sac, it may either be handled with these purse-string sutures alone, or, in case the sac is so large that if it were all inverted into the œsophagus it would produce an obstruction, it may be about two-thirds obliterated with these purse-string sutures and then five or six longitudinal sutures put in.

The after-management of these cases is exceptionally important and consists in giving the patient liquid by rectum for the first twenty-four hours, and later feeding him through a small rubber tube passed through the œsophagus into the stomach, or into the œsophagus well below the point of the diverticulum.

EDWARD L. CORNELL.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Campora, G.: Lumbar Hernia (L'ernia lombare). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 513.

The first case of lumbar hernia was reported by Gararyedt in 1731. The affection is a rare one. The author gives a tabular statement of 166 cases gathered from the literature up to date, and adds one of his own. The patient was a man of 61 years. For about fifteen years there had been a hernial tumefaction in the left inguinal region which was irreducible. Some months ago, following an effort, he felt pains in the left lumbar region to which he paid little attention. This pain was felt only when he was fatigued by work or by standing. A swelling the size of a nut was observable in the lumbar region, slightly painful and disappearing in decubitus, easily reducible, and covered by skin. This was under the twelfth rib, in the costolumbar angle. A diagnosis of lumbar hernia was made and the man operated upon. A longitudinal incision was made over the tumor commencing about the superior margin of the twelfth rib and descending for about 10 cm. On incising the superficial fasciæ the tumor was easily isolated and found, its peduncle occupying Grynfeltt's space. It consisted of a very thick hernial sac covered with a dense adipose stratum and was empty. The mass was reduced and the muscular orifice closed. Recovery was without incident.

Respecting the etiology a lumbar hernia may be congenital or acquired, the latter being generally the result of a direct or indirect trauma. One of the weak spots in the part of the abdominal wall of the lumbar region is represented by Petit's triangle. Another point of weakness in the same region is Grynfeltt's space. The author describes the anatomy of these regions and their surroundings in great detail as it is usually through one or the other that a rupture takes place. A number of the cases reported in the literature are cited to show how the hernia involved these spaces. Both statistics and anatomical findings show that a

lumbar hernia occurs more frequently through the space of Grynfeltt than through Petit's triangle.

W. A. BRENNAN.

Serafini, G.: Varieties of Crural Hernia, Especially Intravaginal Retrovascular Crural Hernia and Pectineal Hernia (Sulle varietà dell'ernia crurale e particolarmente sull'ernia crurale retrovascolare intravaginale e sull'ernia pettinea). *Policlín.*, Roma, 1917, xxiv, sez. chir., 230.

Serafini reports a case of intravaginal retrovascular hernia which he believes is the first authenticated case of the kind reported in literature. The patient was a woman of 57, who for two years had noticed a small tumefaction in the left crural region and a little later a smaller tumefaction in the right crural region. Both were evident in the erect posture and disappeared in the dorsal decubitus. Because the tumors had the characteristics of hernia and since they were situated externally to the crural rings and the latter were closed, the author suspected retrovascular hernia. An incision was made over the site. On incising the superficial strata on the right side the lymphatic lacuna was found closed. Gimbernat's ligament was much distended. On abdominal pressure it was observed that the femoral vessels, especially the vein, rose distended over the tumors. The vascular sheath corresponding to the medial margin of the vein was greatly distended. On lacerating and stripping the sheath a quantity of cellulo-adipose tissue was found, but no sac could be localized. Similarly on the left side the Gimbernat ligament was much distended and on pressure the whole vascular region about the radix of the thigh became prominent. The vascular sheath was especially thick about the medial margin of the femoral vein with a tendency towards the infundibulum. On stripping the sheath adipose tissue as on the right side was found. On search an empty sac about 6 cm. long was found. The neck of the sac was clearly and completely behind the vein and partly behind the artery, its body and fundus were expended in the venous

sheath which was much dilated medially toward the infundibulum, the septum which separated the vein and artery being pushed behind the artery.

The sac was removed and the apertures sutured. The woman recovered without incident, but died two years later of myocarditis. The author was able to clearly verify the retrovascular hernia at an autopsy.

The findings are discussed at length, also the etiology and differential diagnosis. A perusal of the literature shows confusion and incompleteness in the classification of crural hernia. Textbooks are silent as to retrovascular hernia and many authors deny or doubt its existence. Regarding crural herniae generally some include under the head: hernia of Gimbernat's ligament; cruro-pectineal hernia, external crural hernia, retrovascular hernia; cruroperitoneal hernia. The confusion is increased when the group of external crural herniae is considered as different authors comprise under the generic term: hernia external to the femoral artery; hernia situated outside the branching of the epigastric artery, and hernia which evolve into the muscular lacuna. After considering the arguments of different authors Serafini thinks that a rational classification might best be based by establishing two categories of varieties of crural hernia: the first, pure and schematic, having as its basis the hernial portal; the second, complex and exceptional, having as its basis the development and course of the hernial sac.

This proposed grouping is outlined in the following table:

CLASSIFICATION OF CRURAL HERNIAE

1. According to the hernial portal.
 - a External myo-lacunar crural hernia — breaking through the muscular lacuna.
 - b External hernia of the vascular lacuna. The sac pushes between the sheath of the vessels and the ileopectineal sheath.
 - c External intravaginal hernia; between the vascular sheath and the lateral walls of the artery.
 - d Properly termed anterior hernia; between the vascular and the inguinal ligament.
 - e Intravaginal prevascular anterior hernia; between the vascular sheath and the vessels.
 - f Internal intravaginal hernia; between the vascular sheath and the medial face of the vein.
 - g Vasolacunar hernia; either external, anterior, or internal intravaginal.
 - h Intravaginal retro-vascular hernia; behind the vessels, inside the vascular sheath.
 - i Common infundibular hernia; crural in the strict sense, between the vascular sheath and Gimbernat's ligament.
 - j Hernia through Gimbernat's ligament or Laugier's hernia.

2. According to the course and the development of the hernial sac.
 - a Prevascular-internal hernia: intravaginal prevascular hernia which becomes internal by gravity.
 - b Infundibular vascular hernia: intravaginal hernia prevascular at its origin and which by its medial superficies is brought into relation with the vein and occupies the infundibulum.
 - c Cruro-pectineal hernia of Cloquet: a hernia almost always in the crural canal, and hence a common infundibular hernia perforating the pectineal aponeurosis. According to situation may be: intra-muscular, high or superior; sub-aponeurotic, low or inferior.
3. Hernia with pockets:
 - (a) Cooper's variety: the sac after having traversed a single orifice of the cribiform fascia penetrates between the superficial fasciae and subdivides into numerous subcutaneous pockets.
 - (b) Hasselbach's variety shows diverse pockets which traverse distinct orifices of the cribiform fascia.
 - (c) Hilton variety: the ordinary sac sends into the neighboring labium majorum a pocket as thick as a finger.
4. Cruro-peritoneal hernia: a hernia evolving from the crural ring; its pocket is peritoneal abdominal, ordinarily pushed toward the pelvis.
5. Pre-inguinal hernia of crural origin (Rochard's).
6. Double sac hernia. W. A. BRENNAN.

Stincer, E.: Fifteen Clinical Cases of Strangulated Hernia (La estrangulacion herniaria; relacion de quince casos clinicos). *Rev. de med. y ciruj.*, Habana, 1917, xxii, 338.

The author gives short clinical histories of 15 cases of strangulated hernia which have afforded opportunities of studying its distinct clinical forms and to test the value of methods of treatment. The conclusions from his study of these cases are:

1. Never, except under exceptional circumstances to abstain from intervention in a case of strangulation. There is no contra-indication.
2. Taxis is not acceptable in any sense as a method of treatment. It is prejudicial rather than beneficial, similarly with false reductions.
3. Kelotomy with immediate enterorrhaphy is the ideal operation, making sure of the vitality of the herniated loop.
4. The "anus contra-natura" is indicated only when the intestinal lesions are very extensive and the general state of the patient does not permit of an enterectomy.

The author's 15 cases include one case of very rare strangulation, viz., retrograde strangulation.

As complications following the strangulation two cases of enterorrhaphy and one case of occlusion by paresis were observed. W. A. BRENNAN.

Moschcowitz, A. V., and Neuhoof, H.: Relation of Ileo-hypogastric Nerve to the Radical Cure of Inguinal Hernia. *Ann. Surg.*, Phila., 1917, lxvi, 79.

The authors have endeavored to settle the long disputed question as to the physiology of the ilio-hypogastric nerve by mammalian experiments in which the anterior motor roots were sectioned with resulting nerve degeneration in the regions supplied. Their experiments show that the posterior part of the iliohypogastric nerve is a mixed nerve, i.e., both sensory and motor; and that the part of the nerve exposed in the conventional operation for radical cure of hernia is purely sensory.

They conclude that the portion of the nerve exposed in the ordinary inguinal hernia operation should be preserved as there is no necessity for dividing it, and also on account of the temporary anaesthesia of the hypogastric region resulting from its complete division. The nerve should be protected from careless inclusion in the suture line as this may cause a neuralgic pain for a considerable time after operation. A careless division of the nerve is not followed by a local paralysis of the internal oblique muscle and therefore has no bearing upon the radical cure of an inguinal hernia.

GATEWOOD.

GASTRO-INTESTINAL TRACT

Wilensky, A. O.: A Study of the Motor Disturbances Accompanying Ulcer of the Stomach or Duodenum and the Changes Produced by Operation. *Ann. Surg.*, Phila., 1917, lxxv, 730.

To demonstrate the disturbances of motor function which accompany ulcerative gastric and duodenal lesions the author used the method of Cannon and Carlson, kymographic tracings. The patient swallows a small rubber balloon which is then inflated and connected with a mercury manometer. The cases were carefully controlled, and observed before and after operation.

The normal stomach gives a tracing with an intra-gastric pressure of about 5 mm. mercury with a rhythmical rise and fall of lever about every 20 seconds. At much longer but regular intervals there is a sharp rise of the lever to a great height. The former are the "tonus," the latter the "hunger contractions."

Peptic ulcer stomachs fell into 5 groups:

1. The normal type — at operation the lesion is usually found in the duodenum or at some part of the stomach in which it gives rise to little or no motor disturbance.

2. Hyperactive type. Hunger contractions are high and frequent. Tonus contractions are overshadowed and difficult to distinguish.

3. Irregular types. The tonus and hunger contractions are irregular in time and force. Atonic periods occur. The lesion is usually antral.

4. In pyloric obstruction of mild degree the intragastric pressure is raised and the rhythm of contraction slowed. In the higher degrees of

obstruction tonus contractions may resemble hunger contractions. With very advanced obstruction all motor activity is lost, due to muscular atony.

5. The "atony" groups. Case of stenosis with exhaustion of musculature, large callous ulcers on the lesser curvature or posterior surface of the stomach in which atony is a reflex paralysis often with a high grade pylorospasm.

If no lesions were found and ante-operative tracings were normal they remained so immediately postoperative. The exploratory laparotomy had no effect.

If ulcers were found and gastro-enterostomy, pylorotomy, or partial gastrectomy were done the cases fell into 5 groups.

1. Rapid recovery to normal gastric muscular action.

2. Recovery slow due to poor ante-operative general condition.

3. Atony persisted slightly, postoperative slow recovery.

4. Atony persists for a long time especially if due to advanced pyloric stenosis. If atony is due to reflex paralysis noted in the above the recovery is rapid.

5. Cases with improvement in muscular activity but with relapses of atony.

The author gives in detail two case reports exemplifying the above. Compared with the X-ray the two methods show similarities but are not exactly comparable. The X-ray is an observation on a food laden stomach. The kymograph tracing gives observation on a starved stomach — 6 to 18 hours.

K. L. VEHE.

Zeno, A., Fracassi, T., and Lopaz, A.: The Gastric Functions After Gastro-enterostomy for Duodenal and Stomach Ulcer (Las funciones gastricas despues de la gastro enterostomia por ulcera del duodeno y del estomago). *Rev. méd. d. Rosario*, 1917, vii, 155.

In 25 cases on which the authors had carried out transmesocolic posterior gastro-enterostomy and which they had the opportunity of examining post-operatively, the results as regards the gastric juice contents were as follows:

Before operation: Hyperacidity in 68 and normal acidity in 32 per cent of the cases.

After operation: Hyperacidity in 12, normal acidity in 32, no free acid in 36, and hypo-acidity in 20 per cent of the cases.

Hyperacidity therefore fell from 68 to 12 per cent. Only in 2 cases was bile absent after operation. The authors' results, as compared with the figures given by Patterson, show 36 per cent of absence of free acid after operation as against Patterson's 52 per cent, with 80 per cent presence of bile as against Patterson's 75 per cent. The authors are satisfied that gastro-enterostomy diminishes the total acidity and hydrochloric acid; that it provokes the presence of bile; and if there has been hypersecretion it is either diminished or disappears.

As regards motor function and evacuation of the stomach in 21 of 30 patients evacuation was effected only and exclusively by the new orifice. In the others it was effected both through the pylorus and the new orifice, the pylorus being the least used. But the authors have never observed an inactive gastro-enterostomy whatever may have been the situation of the ulcer and whether or not there was stenosis. Their findings therefore are quite contrary to those offered by the majority of observers, who constantly assert that with a non-stenosed pylorus or duodenum food seeks the natural outlet and not that created by the surgeon. Radioscopically they have never observed obliteration nor failure of functioning.

The authors think that failure of gastro-enterostomy is due to (1) its execution without necessity; (2) to defects of technique; (3) to the development of secondary peptic ulcers. Clinical and radiologic details of 25 cases. W. A. BRENNAN.

Le Wald, L. T.: Syphilis of the Stomach. *Am. J. Roentgenol.*, 1917, iv, 76.

After a résumé of the literature on syphilis of the stomach, with quotations and conclusions from a number of authors, the author classifies the roentgen findings in this condition as follows:

1. Diminished size, accompanied by almost immediate evacuation of most of the stomach contents. Traces of food, however, may remain high up at the cardiac end for six hours, or longer.

2. Dumb-bell shaped deformity — due to stenosis of the middle of the stomach over a wide area — in contradistinction to hour-glass stomach resulting from a cicatrized ulcer involving only a circumscribed area. In this type, there is apt to be a compensatory dilatation of the cesophagus.

3. The infiltration may involve only the pyloric region, in which case the findings may closely resemble those of cicatrized ulcer in the same region, and may be accompanied by dilatation of the stomach.

4. Filling defects about the greater curvature or any portion of the stomach, in which case the findings may closely resemble those of new-growths.

When a positive, or even probable, diagnosis has been established, antisyphilitic treatment, such as salvarsan, mercury, and the iodides, should be immediately instituted. Prompt response may usually be expected, but in cases of long-standing cicatrization surgical intervention may be necessary to effect a cure. W. A. EVANS.

McArthur, L. L.: An Improvement in the Technique of Gastric Surgery. *Surg. Clin.*, Chicago, 1917, i, 97.

Fluid is best absorbed in the upper intestinal tract and it may be here introduced through a biliary fistula to great advantage in combating shock, anuria, viscous cycle, and vomiting following gastric surgery. The tube is inserted into the fundus of the gall-bladder and either brought out of the

abdomen through primary incision or through a stab wound. The gall-bladder is washed out to remove clots and mucus and one is then ready to introduce (distal to the stomach) into the duodenum, salt solutions, nutrient fluids, or medicines. Neutral or slightly alkaline solutions only can be used because the mucous membrane of the biliary tract is accustomed to these and is very sensitive to acids. The fluid is allowed to flow in by gravity 5 to 10 drops per second. This is obtained by an elevation of 12 to 20 inches. Excess of liquid introduced gives rise to various oedemas in the lungs, serosæ, and hands and feet.

This method was used with success by Matas in a case of anuria following septic peritonitis, in which he made the first therapeutic biliary fistulæ through a normal gall-bladder. K. L. VEHE.

Rovsing, T.: Contribution to the Pathology, Diagnosis, and Treatment of Chronic Duodenal Ulcer Based on the Study of 133 Cases (Bidrag til det kroniske Doudenalsars Patologi, Diagnose og Behandlung baseret paa Erfaringer fra 133 Tifaelde). *Hosp. Tid.*, Kjøbenhavn, 1917, lx, 621, 645.

Rovsing's report is based on the study of 133 cases of chronic duodenal ulcers, 118 of which were operated upon. A duodenal ulcer or a pyloric ulcer or one higher up in the stomach may all show similar symptoms; but if the stomach findings are negative, when there are long continued symptoms of ulcer it points to a duodenal lesion. Blood in the stools is more frequent in duodenal than in gastric ulcer. This was observed in 74 of the 133 cases. In duodenal ulcer stomach retention is rather rare, but is usual with gastric ulcer. The normal stomach findings may give rise to a wrong diagnosis. Rovsing reports some cases of this type where the troubles were ascribed to hysteria.

In treating duodenal ulcers Rovsing prefers excision of the ulcer with the addition of the Heinecke-Mikulicz pyloroplastic operation, with transverse pyloric suture. Rovsing prolongs the pyloric incision downward into the anterior surface of the duodenum and upward into the anterior wall of the stomach. For ulcers situated on the anterior wall the incision is elliptical and continued up into the stomach. If situated posteriorly the ulcer is incised through the duodenum from the mucosa side. Rovsing refers to the dangers from small bleeding ulcers which may be overlooked and left or which may cause serious hæmorrhage later on. The method which he adopts of opening up the pyloric region enabled even very small ulcers to be seen and excised or drawn up and sutured through. The total mortality in 133 cases was 12 and there were 10 recurrences. The different procedures and results adapted are tabulated. W. A. BRENNAN.

Ogilvy, W. A.: Gangrene of Small Intestine; Laparotomy; Recovery. *Brit. M. J.*, 1917, i, 223.

The case is reported of a woman, aged 34, who was admitted at noon on May 22, 1916, suffering

from acute and constant pain across the lower abdomen. She stated that she had had no previous illness, had been married eight years and had one child five years old. Her family history was excellent. She had been suddenly seized with severe intermittent pain across the lower abdomen at 2 p.m., May 21. When seen at 7 p.m. she was in the knee-chest position in bed in a paroxysm of pain. Her pulse was 75, temperature normal; there was some tenderness and the abdomen was rather rigid. She had not vomited; the bowels had acted once during the afternoon. She was in the third month of pregnancy and had seen a little blood. She thought she was aborting. The uterus was less movable than normal; the external os was closed and patulous. Morphine, gr. $\frac{1}{2}$, was given hypodermically. Next morning she stated that she had had a fairly comfortable night, but had not slept much. The pain was returning and was more constant in character; the abdomen was rather distended, more tender than before, and very rigid; pulse was 90.

She was removed to the hospital forthwith. At 3 p.m. the abdomen was opened in the middle line below the umbilicus. On opening the peritoneum a small quantity of blood-stained fluid escaped, and a coil of distended gangrenous bowel presented. On enlarging the opening in the peritoneum, a second and third coil presented in the same condition. They proved to be about the junction of the jejunum and ileum. A large calcareous mesenteric lymph-node — as large as a bantam's egg — was found, from which a very short, thick band extended to the mesenteric attachment of the bowel, causing a very acute kink at the distal end of the distended bowel. The lymph-node and 3.5 feet of bowel were removed, a side-to-side anastomosis made, and the abdomen closed. The patient made an uninterrupted recovery, but aborted on the eighth day after operation. In ten weeks she was doing her household work and feeling in excellent health. Previously her bowels were rather constipated, now they are perfectly regular.

P. G. SKILLERN, JR.

Kirmisson, E.: Appendicular Epithelioma in a Young Girl (Epithélioma de l'appendice chez une jeune fille de quatorze ans et demi). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1432.

The case reported by Kirmisson was that of a young girl of fourteen and one-half years old, operated upon for acute appendicitis with peritonitis. The appendix was removed. It was large and its free part sphacelous. Near its cæcal insertion its lumen was almost completely obliterated by a white-yellowish mass about the size of a cherry. It was developed at the expense of the mucus and apparently did not penetrate into the muscular wall. Histologic examination showed the tumor to be an atypical epithelioma, the center of it having involved the muscular bed. Two years later the patient was found to be in excellent health.

Kirmisson points out that in the great majority of

cases of appendicular epithelioma there is benignity. The condition in childhood is very rare. In his own large practice he can remember seeing but one other case.

W. A. BRENNAN.

Rivarola, R. A.: Posterior Appendicular Abscesses; Their Operation by the Lumbar Route (Abscesos apendiculares posteriores. Su intervencion por via lumbar). *Prensa méd. argent.*, 1917, iv, 28.

Since 1910 in the author's surgical clinic of the Children's Hospital at Buenos Aires, he has observed only two cases of peri-appendicular abscess with a posterior localization and one with a retro-lateral localization.

In one case the abscess adjoined the posterior face of the colon and cæcum, pushing out toward the front so that it provoked the formation of a projecting tumor in a zone near the anterior and superior iliac spine and with a tendency to extend toward the pelvis. In the other two cases the abscess had a clearly posterior localization, leaving the anterior part of the right iliac fossa intact. In both cases palpation of the appendicular point was painless and pain could be felt only on very deep palpation.

Such localization of appendicular abscesses is infrequent but occurs more often in children than in adults. Statistics show 29 per cent in children, to 9 per cent in adults.

Rivarola thinks that such abscesses are due to the inflammation of an ascending retrocæcal or retro-colic appendix; but the formation of a posterior abscess under such circumstances clearly depends on the behavior and disposition of the peritoneum surrounding the peri-appendicular process.

In treatment Rivarola thinks the best route of approach is the lumbar. It is following the precepts of good surgery to select the shortest and most direct route when this does not involve organs that can compromise the patient or increase the disease. Guyon's vertical incision is the best, as it allows ample drainage. One of the advantages of the lumbar route is that hernia and other complications are practically unknown. W. A. BRENNAN.

Griffin, G. D. J.: Chronic Appendicitis. Ill. M. J., 1917, xxxi, 403.

The paucity of literature on this topic is notable as compared to the abundant literature pertaining to acute disease of the appendix.

A large number of cases are included in the group "neurasthenia." There is no definite rotation of symptoms as in the acute variety. Pain is variable; it may or may not be present and its absence is not of negative value in the diagnosis. If present, it is valuable and corroborative. It is usually well localized in the right iliac fossa, dull, aching and continuous. It may be present for days and then disappear, to return later. On the other hand it may be present and localized, but so indefinite as to make only a subconscious impression upon the individual that he has a right side.

Tenderness is the most important and most constant finding. It may be elicited by the slightest palpation and is always definitely located over the appendix.

The appendix is usually held by adhesions, bent, twisted, or contracted so as to remove it slightly from the usual location, but the tenderness is over the appendix wherever the organ may be situated. Rigidity depends largely upon the degree of tenderness. Slight tenderness will bring out no rigidity except the sudden spasmodic contraction at the moment of pain.

Gastro-intestinal disturbances appear in diverse forms and are usually the cause of the patient's consulting a physician. The bowels are constipated, the stools dry, and laxatives required constantly. Rarely is there diarrhoea. With the constipation are associated the ordinary evidences of fermentation, as flatulency, distention, belching, and eructations.

Dyspeptic symptoms, as loss of appetite, distress, and discomfort after eating, first direct the patient's attention to himself. Chemical analysis shows a marked decrease in acids and motor insufficiency.

Loss of weight is so constant that the patients are usually quite thin. Headache, not throbbing and painful, but dull and depressive, is the rule.

A marked exception detailed is that of a man subject to violent attacks with nausea and vomiting, preceded by constipation and relieved by rest in bed, analgesics, and cathartics.

Wassermann and X-rays were negative. Physical examination revealed nothing beyond a moderate tenderness over the appendix, which was found sclerosed and adherent to the colon from base to tip. He was entirely cured by appendectomy.

Operation in this class of cases benefits the metabolic activities as well as the subjective sensations and physical well being of the patient.

In the long-standing cases atrophic changes occur in the stomach and intestines and if not operated upon they grow progressively worse.

They may finally be operated upon at a stage too late for improvement because of these tissue changes in the stomach and intestines, or they may fall victims to acute attacks that demand interference with the alternative of a possibly fatal issue.

L. R. GOLDSMITH.

Peskind, A.: Intussusception of the Bowel in an Infant, Followed by Obstruction of the Bowels with a Second Intussusception Within Three Weeks After the First Operation. *Am. J. Dis. Child.*, 1917, xiv, 63.

A girl, four months old, was taken ill during the evening of June 14, 1915, with some abdominal distress. She was taken to the hospital June 15th and operated on at 5:30 p. m.

At operation the lower end of the ilium, appendix, cæcum, and part of the ascending colon were found telescoped into the transverse colon. When liberated the incarcerated bowel appeared

very dark, gangrenous in spots. The age of the child and a pulse scarcely perceptible while under anaesthesia precluded any attempts at resection of the devitalized viscus. The appendix, almost black in appearance, was quickly tied off and removed. The wound was closed and the child left the operating room with a very feeble heart action. The operation itself required less than 15 minutes. At 6:15 p. m. the baby, then in its bed, had a temperature of about 100° F., pulse over 180, respirations between 56 and 60. The child, as soon as she recovered from the anaesthetic, was given a few drops of Vichy water every ten or fifteen minutes and was put to the mother's breast for a few minutes at 10 in the evening. The child vomited a few times after the operation. A saline injection was given at 11 in the evening, which was expelled with flatus and was tinged with blood. The following day the temperature went up to 103.2° F., pulse 180 and over. Within 48 hours the temperature and pulse reached normal. The recovery seemed complete within nine days and the patient was sent home June 24, apparently free from signs of any gastro-intestinal disturbance.

At 10:15 a.m., July 8th, just three weeks after the first operation, the child was brought back to the hospital with symptoms of acute obstruction of the bowels. The abdomen was opened and several inches of the ascending colon were found telescoped in the transverse part of the colon. This second intussusception was easily released and the bowel had a normal appearance. At the site of the first intussusception, however, were found the greatest foci of pathological activity. The cæcum and part of the ileum were matted and bound together by unyielding adhesions. The lumen of the bowel felt as though it were obliterated. The only chance for the restoration of the continuity of the lumen of the bowel was to resort to ileocæcostomy, and this was done. The child, not quite five months old, bore the operation seemingly without any additional shock. It required just 26 minutes to disengage the intussusception, to make the anastomosis, and to close the abdominal wound. Scarcely any gastro-intestinal difficulties followed the second operation, but a double pneumonia developed on the third day and the baby had to fight for its life for nearly two weeks. The temperature often exceeded 105° F., and the pulse-rate over 180 per minute. The child remained in the hospital about a month after the second operation and was sent home August 10, 1915. It is now a year and nine months since the child was operated on and at no time since has she evinced any sign of intestinal or pulmonary disturbances.

EDWARD L. CORNELL.

Arana, G. B.: A Case of Total Colectomy for Chronic Intestinal Stasis (Sobre un caso de colectomia total por ecstasia intestinal cronico) *Prensa méd. argent.*, 1917, iv, 13.

Arana's case of total colectomy was in a woman of 38 years who was a victim of marked intestinal

stasis for over 16 years. The author first tried a colopexy of the transverse colon to the abdominal wall, deperitonization of the superficies, and section of pericolic restricting bands. There was absolutely no improvement and as the patient's condition was very deplorable, as a last resort total colectomy was proposed and accepted. The operation was done under high spinal anaesthesia. Anastomosis was made between the terminal portion of the ileum and the superior part of the ileopelvic segments. The total loss of blood was only about 100 grams. The patient left the table in good condition and with a pulse of 80. The postoperative course was satisfactory. A transanastomotic drain was left in place for a week, then withdrawn and in the next few days the patient had spontaneous bowel movements five or six times within twenty-four hours, the matter being semifluid. There was no meteorism, no complications, no great pain, the patient only exhibiting an insatiable and persistent thirst; this disappeared within a month. Histologic examination of the resected colon showed that there was an inveterate generalized colitis in all the colon which had destroyed its normal constitution. Six months after operation the condition of the patient is excellent. There is physical and mental betterment, good appetite and relish for food, and normal bowel movement each day. A postoperative radiograph shows that the terminal part of the small intestine has become somewhat distended as it seems to serve as a reservoir for intestinal matters in lieu of the removed colon. This has been noted by other operators.

The author considers that in his patient the two conclusions of Arbuthnot Lane have been realized: (1) that life is possible without the colon, (2) that certain patients improve under the treatment of colectomy. W. A. BRENNAN.

Corlette, C. E.: Left-Sided Cæcum and Ascending Colon with Absence of Transverse Colon.
Med. J. Austral., 1917, i, 551.

The case is that of a man, aged 30 years, a Greek, who had for years complained of various gastric symptoms and of constipation. He was of neurotic temperament, a bad sleeper, and was very subject to attacks of mental depression. The chief gastric symptom was flatulency after meals, but at times he had pain and excessive discomfort, relieved by washing out the stomach.

The stomach was dilated and situated very low in the abdomen. The duodenum was normal in relationship. No irregularity in the outline of the stomach or duodenum was noticed. The stomach emptied within six hours. There was no pyloric stenosis. There was a peculiar abnormality of the intestine. The cæcum and ascending colon were to the left of the midline and ascended almost vertically to the splenic flexure, there being an absence of a good deal of colon. There was some delay in the terminal ileum and colon.

EDWARD L. CORNELL.

Neill, T. E.: Diverticulitis of the Sigmoid Simulating Carcinoma. *Virg. M. Semi-Month.*, 1917, xxii, 195.

Neill reports the case of a woman 67 years old who had never been ill until a few weeks before examination. At that time she began to complain of rumbling in the abdomen and constipation, the latter having troubled her more or less during all her life.

Laxatives helped for a time; enemas gave no relief. The temperature and pulse were normal. For the previous three days she had much headache. Urine was normal. Nausea appeared and a diagnosis of chronic obstruction was made. Vomiting began the night before admission, the patient sleeping well between the attacks of vomiting. She had lost no weight during the past year and had even gained a few pounds during the past summer.

Her physician said that during the cramps and vomiting there could be heard loud rumbling in the bowels and a large coil could be seen projecting below the left costal margin. Peristalsis had been quieted by a hypodermic of morphine just before the examination and there was no hyperperistalsis visible. Palpation, both abdominal and rectal, was negative.

Suspecting a carcinoma of the sigmoid, a median suprapubic incision was made, and on opening the abdomen, enormously distended large and small intestine, including the cæcum and appendix, presented. A McBurney incision was then made and the cæcum attached to the peritoneum with silk sutures, a pouch being brought out through the wound. This was tapped and the intestines immediately collapsed.

Further examination was then made and the growth found to be situated directly at the pelvic brim and apparently movable. The condition seemed favorable for attempted removal when she would be in better condition and the bowel thoroughly emptied, so a tube was stitched in the cæcum and the median wound closed.

The tube greatly relieved the distention temporarily; it was removed in 48 hours and the bowel widely opened.

The bowel was irrigated freely and great quantities of faecal matter obtained. After three or four days the abdomen subsided completely, when the rectum was washed out and fairly normal movements obtained through the rectum.

Eighteen days after the first operation a left rectus incision was made and after dividing the left tube and freeing the adherent left ureter, the tumor was gradually freed and removed.

End-to-end anastomosis was done, a rubber tube being placed in the lower segment and brought out through the rectum.

The second operation had a normal convalescence and six weeks later the cæcostomy wound was closed under local anaesthesia, the wound healing in four days.

The growth showed on the inner surface one large

and a number of smaller polypoid masses, the tips of which were intensely congested and hæmorrhagic and showed small areas of ulceration.

In the intestinal wall were areas, thick and indurated, but over which the mucosa moved freely. On the peritoneal surface were a number of small thin-walled cysts with clear serous contents.

On section the indurated areas were found to consist partly of fibrous and partly of hypertrophied muscular tissue. There was no abnormality in the arrangement of the epithelium and the condition is evidently a chronic inflammation with polyp formation and with no evidence of malignancy.

L. R. GOLDSMITH.

Lockhart-Mummery, P.: The Three-Stage Operation for Cancer of the Sigmoid. *Proctol. & Gastro-enterol.*, 1917, xi, 80.

Lockhart-Mummery gives credit to Paul of Liverpool, for first advocating this operation and then describes his own technique. At the first operation the loop of bowel containing the growth is drawn out of the wound as far as possible and kept there by a glass rod through the mesocolon or by a couple of stitches. Delivery of the colon is often much facilitated by division of the external mesocolon.

A glass tube is tied into the loop of bowel above the growth either at the time of operation or 36 hours later. After ten days, all that part of the loop external to the abdominal wall is cut off. This does not require an anæsthetic though it is often advisable as there is free hæmorrhage. It does not, however, cause pain beyond some colic if the mesocolon is ligated. The final operation can be performed at any time after the wound has healed. Three cases are described in two of which the author made end-to-end anastomoses in the abdominal wall without opening the peritoneal cavity.

L. R. GOLDSMITH.

Jiménez, L. P.: Original Operation — Colpo-rectopexy (Operacion original — colpo rectopexia). *Anal. d. Hosp. de San Jose, Costa Rica*, 1917, ii, 129.

Jiménez reports an original operation performed by him in a case of prolapsed rectum. The patient was a woman of 60 years. The walls of the prolapsed rectum, which were 14 cm. long and 16 cm. in circumference, were thick and oedematous and covered with pus. There was a cystocele. The condition had existed for 20 years.

A regular Emmet operation was performed with this addition: the denudation was extended, being carried further up and the rectum returned to its normal position; the lowest part of the prolapsed rectum was then fixed to the highest part of the denuded area by silkworm-gut sutures, the first suture corresponding to the lowest point. The fixation was easy since the rectal wall was much thickened. The operation was terminated like the Emmet and a rubber drain 2 cm. wide and 15 cm. long placed in the rectum and fixed to the anus.

This could be easily palpated through the abdominal wall. Patient recovered and tube and sutures removed on twelfth day.

W. A. BRENNAN.

Morales, A.: Total Extirpation of the Rectal Intestine (Extirpation total del intestine recto). *Siglo. méd.*, Madrid, 1917, lxiv, 409.

Morales relates a case of total extirpation of the rectum in a woman 45 years old who showed hard tumorous masses in the lower part of the rectal ampulla with mucopurulent bloody discharge. Morales operated by the coccygeal and sacral method of Kraske of Freiburg, removing the coccyx and left lateral part of the sacrum as called for in that procedure. But as this did not give a sufficiently large operative field, he had to enlarge the bony orifice with the hammer and gouge for 2 cm. to the left. Microscopic examination showed the tumorous mass to be cancer. There is no sign of recurrence more than a year after operation.

W. A. BRENNAN.

LIVER, PANCREAS, AND SPLEEN

Odriozola, E.: Lessons to be Derived from an Error of Diagnosis in a Case of Hepatic Abscess (Ensenanzas que se derivan del error de diagnostico en un caso de absceso hepatico). *Cron. méd.*, Lima, 1917, xxxiv, 204.

In a case which the author after a study of the symptoms had diagnosed as a malignant neoplasm of the liver in which operation would have been useless, autopsy showed a large abscess of the convex face of the liver on the posterior part. Odriozola thinks that such cases of clinical error should be published as well as the reasons which led to them. From his own case he makes these inferences:

1. In every hepatic affection with hepatomegalia and fever before thinking of anything else it should be irrefutably demonstrated that it is not an inflammatory condition — suppurative parenchymatous hepatitis.
2. Abscesses of the convex face of the liver are those which are most frequently confounded with other diseased conditions of the organ and hence result oftentimes in lamentable confusion.
3. Icterus is often absolutely absent.
4. Gastro-intestinal disturbances do not generally enter, at least ostensibly, into the picture of its manifestations.
5. Shoulder pain is earlier, more acute, and persistent than in any other disease.
6. Punctures in front or in the flank, owing to the situation of the diseased area, are negative, consequently it is indispensable to make them at the rear and to carefully avoid the track of the inferior vena cava.
7. The hæmoleucocytary formula, as regards its numerical significance and the predominance of polynuclears, may not correspond to the entity of the suppurative process.

8. Pleuro-pulmonary complications are very frequent in the advanced period of its evolution and should be considered of importance in the diagnosis.

9. Gigantic hepatomegalia is compatible with its existence.

10. This abscess may remain hidden for months without being recognized in a categoric manner.

11. When its presence is suspected the necessity of a peremptory surgical intervention should be recognized.

12. Rapid anæmia, a very notable sign of visceral neoplasms, may be noted in this condition.

W. A. BRENNAN.

George, A. W., and Leonard, R. D.: The Roentgen Diagnosis of a Pathological Gall-Bladder.
Am. J. Roentgenol., 1917, iv, 321.

The author bases his paper on the assumption that only when some pathological change has taken place in the walls of the gall-bladder or its contents can its shadow be demonstrated on the X-ray plate. These changes may be in the form of a thickening of the walls of the gall-bladder, increased density or quantity of its contained bile, the presence of stones or calcium in some form, circulatory or other unknown alterations which singly or in combination may be sufficient to make a visible contrast between the gall-bladder shadow and the shadows from surrounding tissues.

The authors claim that the normal gall-bladder cannot be visualized. Therefore when it is seen on the roentgen plate it is pathological. The presence or absence of gall-stones is considered of secondary importance in the diagnosis. The opaque meal may give valuable information as regards the relation of the pylorus and duodenum to the gall-bladder and thus indirectly indicate the presence of gall-bladder adhesions or deformity. As regards the position of the gall-bladder, as ascertained from a study of plates, the authors have found that it may be most any where on the right side below the diaphragm. Its size may vary from the size of an olive to that of a grape-fruit. The shape of the shadow is roughly pear-shaped, the most constant feature being the characteristic curve of the lower pole.

A. HARTUNG.

Eisendrath, D. N.: The Silent Common-Duct Stone. *Med. & Surg.*, 1917, i, 507.

Eisendrath calls attention to the fact, not generally appreciated, that calculi may be present in hepatic or common bile ducts, without clinical or palpatory evidence. Following the suggestions of Kehr, the author has, in the past four years, explored these ducts in 36 cases in which palpation was negative. In 12 calculi were found. Two of these had been operated upon previously by other surgeons.

Of the four indications given by Kehr, three have seemed to the author of special importance in the

order named: (1) the presence of many small calculi in the gall-bladder or cystic duct; (2) an enlarged, thick-walled common duct; (3) the presence of chills, fever, or icterus. To these he adds a fourth, recurrence of pain or symptoms of cholangitis (chills, fever, etc.) after operations, such as drainage or removal of the gall-bladder, or even after either of these combined with choledochostomy.

He has found that the chief indication for opening the common duct, when palpation of the ducts is negative, is the presence of many small calculi in the gall-bladder.

In the nine cases not previously operated upon, in which stone was found on exploration of the duct, but which were negative to palpation, the symptoms were as follows:

1. Pain—not to be distinguished from that due to the gall-bladder.

2. Icterus—slight and only during attacks of pain, in three cases.

3. Chills and fever—in two cases. The common duct varied in size from a little finger to a thumb. The pancreas was hard and enlarged in three cases.

The author believes that systematic exploration of the common and hepatic ducts does not increase the mortality of the operation. Symptoms pointing to common-duct calculi may be absent and silent calculi may escape palpation, accordingly the surgeon should be prepared to make a thorough exploration of the bile passages if one or more of the four indications given are present.

It is his practice at the present time to open the gall-bladder and, after the calculi have been taken out, to use it as a tractor while the common duct is opened in its supraduodenal portion. After the common duct has been explored, the calculi removed and a drain inserted, a cholecystectomy is performed as the last step in suitable cases.

ALBERT EHRENFRIED.

Haggard, W. D.: Splenectomy in the Anæmias and Other Blood States Associated with Enlargement of Spleen and Liver. *J. Am. M. Ass.*, 1917, lxi, 79.

Splenic anæmias which might, broadly though inaccurately speaking, include all cases of splenic tumors with chronic anæmias, have been cured by splenectomy. The author reports a cure in a case of Banti's disease and cites cases of the Gaucher and Von Jaksch type in which removal of the spleen has resulted in a cure. Gastric hæmorrhage of unknown origin may be a symptom of splenic anæmia. Although no definite cure has been made in pernicious anæmia by splenectomy, still many patients have been benefited thereby. It is not improbable that the continued destruction of the red blood-cells, after removal of the spleen, in this disease, may be due to the continued and vicarious activity of the hæmolymp glands. Hæmolytic jaundice clears up almost immediately after removal of the spleen. Splenomyelogenous leukæmia, as ordinarily encountered, is notoriously inappro-

priate for splenectomy, except in selected cases after the full limit of improvement following X-ray or radium treatment.

R. B. BETTMAN.

Denis, W.: Influence of Splenectomy on Metabolism in Anæmia. *Arch. Int. Med.*, 1917, xx, 79.

Although it has long been known that the removal of the spleen can be effected with impunity, comparatively little data is available regarding the relation of this organ to metabolism. A few experiments made on dogs have led essentially to negative results, while in the four cases in which metabolism studies have been conducted on human subjects, both before and after splenectomy, it was found that more or less definite metabolic changes could be detected after operation.

In the cases studied by UMBER, in which splenectomy had been performed on two persons suffering from Banti's disease, this investigator found that after splenectomy it was easier to bring the subjects into nitrogenous equilibrium, a fact which he attributes to the "toxic" action of the spleen in this disease. It was also noted that the output of purins was slightly increased. In one case studied by MINOT, a woman suffering from pernicious anæmia, it was found that whereas the patient had shown a slight negative nitrogen balance before splenectomy, this changed to a positive balance after operation. This worker also found a slight increase in the percentage of urea nitrogen in the urine after splenectomy.

In a case of congenital hæmolytic icterus studied by GOLDSCHMIDT and his collaborators, it was observed that a slight positive nitrogen balance before splenectomy was followed by an increased retention after operation; that the output of uric acid showed a decrease of 47 per cent after operation, and that a larger loss of iron through the fæces before splenectomy was followed by a decrease of 40 per cent after operation.

During the past year DENIS has conducted metabolism experiments before and after removal of the spleen on six patients who were operated on for the relief of various types of anæmia at the Massachusetts General Hospital. In all cases the patients were kept in bed during the periods of observation, and were under the care of a special nurse trained in metabolism work, who had entire charge of the weighing, cooking, and serving of food, the collection of excreta and the drawing of blood. Body temperatures were taken by mouth each day, morning and evening. No deviation from normal appeared in any case.

In each case a purin- and creatin-free diet was selected, suitable both qualitatively and quantitatively to the taste of the individual patient. This diet was then used in the pre-splenectomy as well as in the post-splenectomy periods, the subjects being in each case required to eat all food served them. As a result of this study DENIS makes the following summary:

Metabolism studies have been conducted before

and after operation in six cases of anæmia in which splenectomy was performed. These included two cases of pernicious anæmia, two of Banti's disease, one of family jaundice, and one of atypical splenic anæmia.

It was found that while, in some of the cases examined, changes in the excretion of certain bodies occurred, these changes were not constant; thus in two cases the uric acid output was much increased after operation, in one it was reduced, while in three no change was noted.

In a series of observations on the phosphate excretion it was found that while in five cases the output of phosphates by the kidney was increased after operation, in one it was decreased.

It is of interest to note that there is no relation between these changes in uric acid and phosphate excretion and the increase in leucocytes noted in the blood-counts during the postoperative period. Thus in one case 8,100 white blood-cells were present during the first period and 126,000 during the second, whereas there was a decrease in the excretion of phosphates and uric acid. In one case, however, the white blood-cells increased only from 3,000 to 7,100, while the uric acid and phosphate excretion was almost doubled.

A study of the sulphur excretion showed no changes, either relative or absolute, which could in any way be attributed to the removal of the spleen.

Blood analyses did not confirm the findings of KING and EPPINGER regarding the increased content of fat in the blood after splenectomy; cholesterol was found to be more or less increased in every case. The author has noted in several cases, however, that in anæmia the low blood cholesterol figures so commonly found in this disease almost invariably increase noticeably when the blood picture is improved, whether this be accomplished by transfusion or by spontaneous remission.

GEORGE E. BEILBY.

Turner, C. G.: The Surgeon and the Spleen. *Practitioner*, Lond., 1917, xcvi, 511.

The author describes in detail 8 cases in which he performed splenectomy. He lost 2 of his cases, but these 2 were cases of traumatic rupture and poor surgical risks. The remaining 6 were splenectomized for the following conditions and were known to be alive and well months or years afterward.

Wandering spleen.....	I cured
Wandering spleen with twisted pedicle.....	I cured
Splenic anæmia.....	I cured
Splenic anæmia (?) of infants.....	I cured
Splenic anæmia with recurring jaundice.....	I cured
Banti's disease.....	I cured

The author states that splenectomy should be considered in certain types of pernicious anæmia and of cirrhosis of the liver. Even in the leukæmias, he says: "We must be neither pessimistic nor biased, for it is possible that, in the future, operative medicine may be able to do something for them. For the present, however, it must still

be the rule that cases of leukæmia are outside the scope of legitimate surgical enterprise."

In the immediate after-history of splenectomies, the author calls attention to the frequent occurrence of a little left-sided basal pleurisy. This was present in nearly all his cases. It comes on about the fourth day, but soon clears up, and only causes temporary inconvenience. LUCIAN H. LANDRY.

MISCELLANEOUS

Calabrese, U., and Rossi, B.: The Surgical Ambulance and Abdominal Wounds (*L'ambulanza chirurgica e le ferite dell' addome*). *Policlin.*, Roma, 1917, xxiv, sez. *prat.*, 890.

In Calabrese's ambulance service 264 abdominal wounds were treated. There was a global percentage of recovery of 47 per cent: true operated and recovered abdominal wounds showed 36 per cent.

Rossi treated 315 cases and also had a global recovery of about 47 per cent. The extraperitoneal wounds showed 82.65 per cent recoveries. Of the 139 penetrating abdominal wounds which were operated upon 26 involved the parenchymatous organs only and gave 61.53 per cent recoveries. There were 110 gastro-intestinal lesions with 31 per cent recoveries. The author thinks that only 4 or 5 of the 110 could have been expected to recover spontaneously. Referring to the high figures of recovery claimed by abstentionists he thinks that many of the cases in which a diagnosis of abdominal penetrating wound is made are really only superficial wounds of the walls or of the neighboring parts.

Rossi thinks that the conduct to be observed is immediate intervention in penetrating wounds in which there is certainty or a well-founded suspicion of endoperitoneal lesion of a hollow viscera, where there is hæmorrhage, flow of urine, or flow of bile, since there is still a chance of saving such patients. Expectant and medical treatment should be used in other cases. W. A. BRENNAN.

Don, A.: Abdominal Injuries in a Casualty Clearing Station. *Brit. M. J.*, 1917, i, 330.

In discussing the general principles of treatment of war wounds as compared with those in civil life, the author states that he can see no reason for departing from the pre-war attitude of exploratory laparotomy in all cases of acute abdomen. Even if a patient be in extremis there is a better chance by operation. There is often none after waiting. The chief danger in the first twenty-four hours is hæmorrhage. The bowel seems completely paralyzed at first by the blow of the missile, so that no movement takes place for at least twenty-four hours, the injured bowel lying directly beneath the wound of entry.

The indications for operation are pain and rigidity of recti, marked shock, or signs of hæmorrhage. Hæmorrhage seems to cause more pain and rigidity

than any other condition. The reason for this is not clear.

Incision is made with the bullet wound at its center. The injured portion of the bowel is sutured or excised. The peritoneal cavity is then washed out with hot normal saline solution. Saline is given intravenously before, during, and after operation. The greater portion of the cases are treated in the horizontal position.

There is usually little to guide one as to diagnosis of the organ involved, but during the first six to twelve hours hæmorrhage is nearly always distinguishable from simple perforation because of the greater severity of symptoms. Hæmorrhage is the chief danger in wounds of the liver. Concussion may destroy half the liver, even when the bullet has not hit the organ. The stomach and small intestines were the organs most frequently wounded in the author's experience. Wounds of the stomach were sutured in all cases. Those of the intestines were repaired by circular anastomosis with very low operative mortality. A detailed report of twelve typical cases is given.

C. A. HEDBLOM.

Rost, F.: Intraperitoneal Rupture of the Bladder. *Muenchen. med. Wchnschr.*, 1917, lxiv, No. 1.

The author says that according to Zuckerkandl, Rovsing, and others a rapid peritonitis is the cause of death in the case of intraperitoneal bladder rupture. Bartels who on investigation found that the mortality in the first three days after the accident was 50 per cent found also that in many of the autopsies there were no signs of grave peritonitis, or even no peritonitis recorded. This he has doubted, believing that peritonitis must have been present. Where the peritonitis is not apparently sufficient to have caused death, Bartels thinks that this is due to shock. A study of the literature shows that in untreated bladder ruptures spontaneous recovery occurs, but very rarely. The majority of patients die without marked peritonitis within three days, from a cause unknown. Some die later, part from peritonitis and part from some undefined cause with slight peritonitis. Rost reports two cases of this last kind. The first was a man of 42 years. After a severe fall no urine could be expelled. The urine and blood were withdrawn by catheter but at low pressure. The patient died after four days. The vesical lesion was considered a laceration of the mucosa, but a possible laceration of the ureters could not be excluded. Autopsy showed a transverse tear in the bladder posterior wall near the neck about 5 cm. long. The catheter had passed through this into the abdominal cavity in which there was a large quantity of urinous fluid. No inflammatory alterations of the peritoneum could be found.

The second case of rupture was also found at autopsy and was not suspected and there was an irregular intraperitoneal tear of about 1.5 cm. There was a slight degree of peritonitis.

In both of these cases of untreated intraperitoneal bladder rupture death occurred in from three to five days after the traumatism. Clinically there were no symptoms of peritonitis. What then was the cause of death? To solve this the author carried out experiments on seven dogs. Based on his results the author thinks that intraperitoneal rupture of the bladder and the consequent abundant reabsorption of urine produces a severe uræmic condition, owing to which animals die within two

or three days and before a peritonitis is developed. He thinks also that in human pathology the high mortality in such lesions in the three first days is a consequence of uræmia, and that undoubtedly in cases where death occurs later uræmia is the principal cause. Hence it is an error, when there is a suspicion of an intraperitoneal bladder rupture, to wait and look for peritonitic indications before intervening. Exploratory laparotomy when diagnosis is doubtful is justified. W. A. BRENNAN.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Galvin, A. H.: Osteochondritis Deformans Juvenilis. *Am. J. Orth. Surg.*, 1917, xv, 664.

The author reports a case in which trauma plus weight-bearing seemed to be the etiological factors. There was a definite trauma with a negative X-ray, then a period of weight-bearing followed by the usual symptoms and confirmed by X-ray.

Physical examination revealed a well developed and nourished boy with negative physical findings except for his right hip and leg. Considerable limp was noted when walking, some atrophy of the right hip and buttock, slight limitation in the internal and external rotation of the hip-joint, flexion abduction and adduction not limited, no pain on any motion. Measurements showed one-half inch shortening, with three-fourths inch atrophy of the thigh, one-fourth inch atrophy of the leg. X-ray taken at this time showed typical changes as found in osteochondritis deformans. The patient was put in a plaster from the axilla to the ankle, in an abducted position, with instructions to remain as quiet as possible. This cast was allowed to remain on for six weeks, then a short Lorenz spica was applied for another six weeks, followed by a flannel spica up to the present time. Examination four months from the first visit shows no shortening, no limp or pain. Some atrophy is still present about the buttocks. X-ray pictures show some diminution in bony changes about the epiphysis.

PHILIP LEWIN.

Freiberg, A. H.: To what Extent Have the Sun's Rays an Influence in the Treatment of Bone and Joint Tuberculosis? *Am. J. Orth. Surg.*, 1917, xv, 625.

To begin a clinical experiment, three cases were selected, for the reason that they had been in the hospital for a long time, during which they had failed to make satisfactory progress in spite of treatment in recumbency in the open air under very satisfactory conditions—cases of "open" tuberculous bone disease, all of which had been under

observation and control for a long period. In all of the cases operations had been done without success, if by this is meant that a cure of the diseases seemed not to have been brought nearer thereby. Moreover, in all three cases several months had been consumed in attempting, by means of good nursing, care in recumbency in the open air, to bring these patients to recovery. There was no result of this care as far as the surgical conditions themselves were concerned, even though it could not be denied that the general appearance and condition of the three patients showed some benefit. In each one of these cases the Wassermann test was made, with a negative result.

From his experience with these cases the author concludes as follows:

1. Exposure to the sun's rays, as here practiced, resulted in speedy improvement, which could fairly be attributed to this agency.

2. The retrogression which ensued upon having to abandon the systematic use of the sunlight seems to emphasize this fact, and makes it desirable to continue this during the winter in our own environment.

3. The results which he has obtained seem to indicate the value of this method, even in the vicinity of large cities and at low altitudes, where, according to Rollier, the potency of the ultraviolet rays is greatly diminished by the stratum of moist and unclean air through which they must pass.

4. It is by no means certain that the ultraviolet rays are the essentially active or the only active part of the sunlight, in a therapeutic sense. In his experience the use of the quartz ultraviolet lamp, the so-called Alpine sun lamp, has failed to show that it may be considered even a fair substitute for sunlight. Its light, on the other hand, is quite rich in ultraviolet rays.

5. It seems worth while to attempt to construct a form of shelter for patients, which will protect them from unendurable cold and especially humid winds, thus making possible the continuance of treatment during bright days of the whole winter season. It seems necessary to expose the whole body surface in order to obtain the best results.

Such shelters should, therefore, have as covers some material permitting the easy passage of the ultra-violet rays. An investigation in this direction is under way, but has not yet yielded any result of value.

PHILIP LEWIN.

Faber, H. K.: Amyotonia Congenita: a Study of the Known Cases with Report of Three New Cases. *Am. J. Dis. Child.*, 1917, xiii, 305.

Based upon a tabulation of 115 cases reported in the literature, seemingly correctly diagnosed, Faber details a statistical survey of a symptom-complex that he terms *amyotonia congenita*, a disease beginning at birth or in early infancy due to a congenital developmental defect of the lower motor neuron and of the voluntary muscles, clinically characterized by weakness, hypotonia, a quantitatively diminished electrical response in the muscles, and especially without disturbances of sensation or mentality.

Faber believes the condition due to a hereditary or reproductive defect as evidenced by deficient or late quickening, familial occurrence, and the fact of its frequent association with old parentage. Pathologically the muscles and motor nervous system are at fault. Abnormal joint mobility and often absent superficial and deep reflexes are found.

The prognosis is usually fair as to improvement, but often death comes from pneumonia. In treatment there is nothing specific. Besides strychnine and cod-liver oil, exercise must be maintained by active and passive movements when possible.

R. G. PACKARD.

Novis, T. S.: The Treatment of Wounds of the Knee-Joint. *Lancet*, Lond., 1917, cxiii, 12.

Injuries of the knee-joint met with in military surgery are produced by rifle bullets, shrapnel, or pieces of shell. Bayonet wounds are rare. There may or may not be injury of bones entering into the formation of the knee-joint at times, injury is so severe as to necessitate immediate amputation but in most cases an attempt should be made to save the limb.

These injuries may be divided into four classes:

1. Contusions of the joint with hæmorrhagic effusion. Thorough cleansing with removal of foreign material and complete rest in a splint is usually all that is necessary.

2. Wounds of the joint by bullets traversing joints without severe injury to any bones and into which infective material has not been carried. Excision of the wound and suture of the synovial membrane usually is sufficient.

3. Wounds of the joint with gross injury of one or more bones of the joint without infection. Excision of the wound, maintaining the fragments of bone in good position, and complete rest is the usual treatment.

4. Wounds of the joint with or without gross injury to bones with infection of the synovial cavity. If the case is seen early, complete excision of the wound, removal of foreign material, and suture of

the synovial membrane after carefully washing out the cavity with ether may prove efficacious, followed when necessary by aspiration and injection. Satisfactory irrigation of the knee-joint is difficult if not impossible.

In cases seen late there is usually suppuration in the posterior pouches of the knee-joint necessitating drainage. A free incision is made into the sub-cruræus bursa and into the lateral pouch on either side of the patella and drainage tubes inserted. An incision is then made on either side between the hamstring and the gastrocnemius, and the ligament of Winslow incised, longitudinally over the condyles of the femur.

The limb should be fixed on a splint in a slightly flexed position. Irrigation of the joint with antiseptics or the use of hot fomentations are beneficial. The drainage tubes are removed as soon as possible and passive motion begun early.

Of five cases of infection of the knee-joint with suppuration and establishment of drainage one died of pyæmia.

V. C. HUNT.

Baer, W. S.: Sacro-iliac Strain. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 159.

The sacro-iliac synchondrosis is a misnomer — the sacro-iliac joint is a true joint and possesses a definite amount of motion and therefore is subject to varied strains.

Baer divides sacro-iliac strain into two definite classes with entirely different sets of symptoms: (1) in which the sacrum in its superior border tilts backward, and (2) in which it tilts forward. While conditions of the first class are due to strains of childbirth, direct and indirect traumatism, congenital malformation of the spine, and static abnormalities such as paralysis of one thigh, the injuries of the second type are more often due to general visceroptosis, misplacements, neurological diseases, as progressive muscular atrophy of the spinal muscles, and general lack of muscle tone.

Symptoms vary in character and degree. In the first class the pain varies from that of ache across the lumbar region of one side to that of severe incapacitating pain passing down to the calf muscles, but in the second case the complaint is usually that of a persistent tired feeling in the hollow of the back. Diagnosis is usually simple. In the first type there are: history of preceding trauma or strain; pain on pressure over the joint posteriorly or anteriorly just below and to the side of the umbilicus and which is referred down the sciatic nerve; obliteration of lumbar lordosis; deviation of spine in unilateral cases; positive Kernig sign; and the X-ray showing a backward tilt of the upper sacrum.

The second type occurring mostly in older girls and nervous women gives no history of trauma, very little tenderness over the joint, no positive Kernig, but there is an indefinite tired feeling and an exaggerated lordosis. Tuberculosis of the sacro-iliac joint, arthritis of the lumbar spine, and gynecological conditions must be differentiated.

Treatment must be supportive or manipulatory. Adhesive strapping, or, if necessary, a more permanent brace or sacral pad, may have to be worn, but if this conservative treatment is not sufficient, manipulation is of value. With the patient completely anesthetized manipulation consists in completely flexing the fully extended limb on the abdomen. Many cases are immediately benefited by this act, provided a plaster cast is worn for ten days. Of the second type cases are relieved by applying proper support and massaging abdominal muscles, correcting visceroptosis, and attending to any existent gynecological conditions.

R. G. PACKARD.

Kleinberg, S.: A Case of Volkmann's Ischæmic Contracture. *J. Am. M. Ass.*, 1917, lxxviii, 1473.

Kleinberg's case gives the typical history for Volkmann's paralysis; a physician in applying a plaster-of-Paris cast to a fractured forearm, had neglected to wrap the arm in any padding, had hidden the fingers from view, and in three weeks found the hand and fingers swollen, powerless, and somewhat contracted. By using the elastic traction method of Robert Jones for a month, the hand had been extended to 150°, and by two months the boy had regained such excellent use of the hand that the apparatus was discarded.

The conclusions reached are old ones, but important: sufficient padding must be included beneath a plaster cast on an injured limb; the fingers should always be exposed to observation and actively movable; any unusually severe pain, extreme pallor, cyanosis, or swelling indicates the removal of the cast; and the successful management of ischæmic contractions lies in the early and persistent stretching and active and passive motion.

R. G. PACKARD.

Kurtz, A. D.: Apophysitis of the Os Calcis. *Am. J. Orth. Surg.*, 1917, xv, 659.

This is an affection of the heel occurring in children. In eight years' service in the Orthopedic Department of the Samaritan Hospital, there have been recognized only the three cases which form the basis of this report. The condition is one of enough rarity, from both a literary and clinical aspect, to warrant reporting cases as they may occur.

The usual history is that of a fall from a height landing on the heel. Pain immediately develops in the heel and is made worse by function and relieved by rest. Pain causes limping and the patient "turns his ankle and throws his foot." Examination reveals a tender area in the sole of the foot, a little behind the tubercle of the os calcis, extending upward on the inner side of the heel. The entire heel is thickened, the soft structures giving a peculiar tension, which Sever calls "porky thickening." The author believes that the condition is one that is caused by an overstrain of the epiphyseal junction some time before complete ossification occurs. The

epiphysis of the os calcis ossifies from two centers, one appearing about the eighth year and the other one some time later, the lower one appearing first; full ossification and union with the body, or apophysis occurring about the fourteenth year or a little later.

It seems probable that in a child, before union of the two portions of the os calcis has occurred, trauma will give rise to the symptoms mentioned, viz., pain in the heel, accompanied by tenderness and "porky thickening."

The radiographic pathology is — quoting Sever — "an enlargement of the affected epiphysis along the epiphyseal line, with cloudiness between the epiphysis and the os calcis, suggesting a deposit of new bone, and often with a partial obliteration of this epiphyseal line. These findings are constant and do not occur in any other condition."

The prognosis, is good for ultimate recovery, provided the proper treatment is carried out. It is probable that the nearer ossification is completed the sooner the child will recover. That spontaneous cure will occur seems unlikely when we consider that one of the cases ran along two years without any amelioration of the symptoms.

As the condition is a mechanical one, it is hardly likely that drug treatment would be of avail. The indications are plainly, rest until pain has subsided, usually four weeks in a plaster-of-Paris cast, and then some means should be used to relieve the strain from the heel while it is functioning. This is met by the use of the rubber pad in the heel of the shoe.

PHILIP LEWIN.

FRACTURES AND DISLOCATIONS

Seidel: Humerus Fracture of Grenade Throwers. *Muenchen. med. Wchnschr.*, 1917, lxiv, No. 6.

Seidel describes a type of fracture of the humerus observed in throwers of hand grenades in war.

At the moment in which the hyperextended arm with an energetic toss throws the grenade a sharp pain is felt in the arm which then falls inert. In two cases referred to by the author the fracture was at the lower third of the humerus without much displacement. Both men were quite robust and had no antecedents to account for the fracture. It was, therefore, in each case due to the muscular action.

In peace times such fractures are observed in involuntary muscular contractions of epileptics and as a consequence of voluntary muscular actions in determined movements. Such are usually confined to the limbs. To such fracture by voluntary muscular action belong detachments of the point of insertion of certain muscles or muscle groups; for example, the coronoid process of the mandible, the coracoid process of the scapula, etc.

The long tubular bones may be fractured by muscular traction of some other point and this frequently happens to the humerus.

Gurlt, in 85 cases of fracture of the tubular bones,

by muscular contraction, found 57 referred to the arm, 15 to the thigh, 8 to the leg, and 5 to the forearm. Of 56 humerus fractures due to muscular traction, according to Gurlt, 28 were in consequence of throwing movements. In 12 of these the seat of fracture was in the lower third, in 9 in the superior third, in 2 about the middle, in 5 not indicated.

Regarding the mechanism of this fracture some think that when the arm is suddenly fixed in the terminal position in the act of throwing, that part of the humerus situated under the deltoid insertion tends to maintain its movement and owing to the strong velocity is fractured in the point of fixation, viz., corresponding to the insertion of the deltoid. The author, however, does not believe that this explains fractures at the middle or of the lower third of the bone. He attributes fractures at the superior extremity of the humerus near the deltoid insertion or higher to contraction of this muscle; and fractures in the middle or in the lower third to contraction of the triceps muscle. W. A. BRENNAN.

Williams, R.: Universal Extension Splint for Gun-shot Fractures of the Upper Limb. *Lancet*, Lond., 1917, cxiii, 48.

A splint for gunshot fractures should provide the following features:

1. Efficient immobilization of the whole limb.
2. Ready access to the wounds.
3. Extension of broken segments.
4. Maintenance of joints in physiological rest or of maximum functional utility.
5. Distribution of pressure over as wide an area as possible.
6. Lightness and adaptability for application and transport.
7. A composition of rubber and metal which can be easily cleaned and sterilized.

This splint is of galvanized wire after the pattern of the cradle splint of Major E. Hay Groves, but the framework does not pass under the axilla. The shoulder piece is hinged to the framework and allows change in its position. A rubber tubular band passes under the axilla and is attached by the hinges of the shoulder pieces. To the forward end of the splint is attached on a pivot an angled loop of wire which may be set at any angle of supination. A flat elastic band is passed under the wrist and passed over the back of the hand, the hooked end being attached to the angled loop of wire. Accessory rubber slings are used as necessary. A T-shaped metal loop is hooked on at the lower angle and a broad elastic band is attached below the elbow for fractures of the humerus and behind the elbow for fractures of the forearm.

The splint may be used for fractures of the humerus, forearm, or in the elbow region.

The advantages of the splint are as follows:

1. Only one splint is needed for any fracture of the upper limb.
2. A gradual painless and sufficient extension is effected.

3. It is the ideal splint for field dressing stations.
4. Its weight is one and three-fourths pounds.
5. It can be packed flat or in sections.
6. The entire splint can be sterilized or placed in an arm bath.
7. It is comfortable to the patient.
8. The nurse's work is reduced. V. C. HUNT.

Lagoutte: Primary Transformation of Open Gun-shot Thigh Fractures into Closed Fractures (De la transformation primitive en fractures fermées des fractures ouvertes de cuisse par blessures de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1546.

In 7 cases Lagoutte attempted immediate primary reunion and transformation into closed fractures of open fractures of the thigh. Four of the cases were successful. The wound was cleansed without using an antiseptic. These cases were treated four hours, fourteen hours, seventeen and one-half hours, and forty-nine hours respectively after injury. In the cases which did not give good results, infection had already set in at the time of operation. In the successful cases consolidation was effected in a period varying from 25 to 42 days. The steps of the technique are radioscopic examination; wide opening up by suitable incisions; extirpation of contused tissues; vigorous cleansing of the bone in the injured area and removal of free and devitalized bone chips; curettage; removal of clots; and wiping out cavities. After complete surgical cleansing the first principle to observe is not to place any foreign body, drain, mesh, etc. in the fractured area. To ensure evacuation of any blood, etc., the first sutures need not be hermetic. After forty-eight hours if there is no temperature, nor local reaction, the sutures are drawn tightly which renders the closure complete. American immobilization apparatus is used. If there should be fistulization a simple secondary intervention is called for to remove some badly tolerated bone chip, etc. W. A. BRENNAN.

Tesson: Fracture of Neck of Astragalus (Fracture du col de l'astragale). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1014.

In an astragalus fracture, the result of a fall, reported by Tesson, the anterior fragment, the head, remained in place; the posterior fragment was driven inward under the internal malleolus, so that its lower face was inside. There was a third small fragment belonging to the lower part of the fibular face of the astragalus. The clinical aspect was that of a bimalleolar fracture.

Astragalectomy done one month after the injury gave an excellent result. W. A. BRENNAN.

Webb, C. H. S., and Snell, F. R.: Traumatic Dislocation of the Right Half of the Pelvis. *Arch. Radiol. & Electrotherap.*, 1917, xxii, 33.

The patient was injured presumably by having the roof of a dugout fall on him while standing with

his left foot two steps higher than his right and leaning outward.

He complained afterward of pain in the hypogastrium and sacral region and had hæmaturia. The right pubic crest was displaced upward and backward and the right iliac crest was three-fourths inch higher than the left. The posterior superior spine was posterior to the sacral spines. There was considerable swelling over the right pelvis due to extravasated blood and some abnormal mobility. No paralysis, paræsthesia, or referred pain along any particular nerve was present, nor any alteration in the femoral pulse or in that behind the ankle. Rectal examination disclosed no injury to the rectum. The clinical diagnosis was fracture of the pelvis.

Roentgen examination showed a complete backward and upward dislocation of the entire right half of the pelvis. There was also a small fracture of the ascending ramus of the ischium which, however, had no direct relation to the dislocation.

A. HARTUNG.

SURGERY OF THE BONES, JOINTS, ETC.

Chalier, A.: High Amputations in War Surgery: 46 Cases (Note sur les amputations de cuisse in chirurgie de guerre à l'occasion de 46 cas). *Lyon chir.*, 1917, xiv, 591.

Chalier reports 46 thigh amputations for gunshot wounds, 24 of which were for gaseous gangrene, 9 deaths; 6 for vascular gangrene, 2 deaths; 5 for secondary hæmorrhage of main vessels, 2 deaths; and 11 for early or late septicæmia with 2 deaths.

As regards technique, Chalier performed 2 flap and 44 flapless amputations. Of the latter, 21 were in the classical manner, circular and funnel-shaped, and 23 guillotine amputations. He prefers this last method in emergency cases, such as gaseous gangrene, because it occupies the least amount of time, permits the greatest possible free drainage, and saves length of limb, the skin being divided at the lowest possible point.

If better conditions permit, a definite operation can be performed immediately, and the author employs the funnel-shaped circular or the flap amputation. In 6 cases he sutured primarily and had 5 successes.

The stump is immobilized in a high position and must be carefully watched during the first days if the operation has been done for gaseous gangrene.

As regards complications, the following were observed: retention of pus in some cases of crater-shaped circular amputations; 2 cases of gaseous gangrene; 2 cases of tetanus (1 fatal); 4 cases of phlebitis of stump; and 3 cases of pulmonary embolism, 2 of which died.

Five stumps needed a secondary regularization and recovered within ten days by first intention.

W. A. BRENNAN.

Tuffier, T.: Thigh Amputation in the Middle Third, Conical Stump; Dermo-epidermic Grafts; Functioning with Apparatus (Amputation de cuisse au tiers moyen. Moignon conique. Grêffes dermo-épidermiques; état fonctionnel après appareillage). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1392.

A soldier on whom a thigh amputation had been done showed three months later a conical stump with a wound as large as the hand without tendency to cicatrization. As re-amputation would have called for the sacrifice of 8 cm. of bone, and transform a middle third amputation into a superior one with a much smaller functional value, Tuffier sterilized the wound with Dakin's solution and applied dermo-epidermic grafts over its entire surface. Reunion was complete and the thigh has preserved its suppleness and strength.

While the stump is by no means ideal Tuffier thinks it is sufficiently satisfactory, adapts itself well to apparatus, and the man walks well.

W. A. BRENNAN.

Phocas: Gritti's Operation: Reamputation by the Spiking Method (Operation de Gritti; réamputation par le procédé de l'enclouage). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 986.

A disarticulation of the knee was made in a soldier who received a left leg wound the anterior part of the patella being preserved with the idea of later on doing a Gritti operation. This was done, the patella being retracted and a myotomy necessitated to bring it near the surface of section of the femur which had been made above the condyles. Nevertheless, Phocas says the patella would not have kept its place except for his having employed a method which he thinks he was the first to use, viz., to nail the patella through the skin to the femoral surface with a Steinman nail. The nail was left in place for a month and then removed. It did not annoy the patient. Although there was a slight suppuration the result was excellent, and the patient can lean on the stump with the greatest ease.

W. A. BRENNAN.

Chaput, H.: Modified Chopart Operation; Horizontal Intracalcaneum Amputation; Good Morphologic and Functional Result (Opération de Chopart modifiée; amputation intracalcaneenne horizontale; bon résultat morphologique et fonctionnel). *Bull. et mém. Soc. de chir., Par.*, 1917, xliii, 1173.

Chaput's modified Chopart operation was performed on a man who showed a large perforation in the head of the fifth metatarsal. The Chopart disarticulation was first executed according to the classic method. Chaput then made the incision for Farabeuf's resection of the calcaneum, and in order to prevent basculation of the astragalus and calcaneum, the lower face of the calcaneum was made horizontal by a cross-section. The Achilles tendon was resected for a length of several centi-

meters, and the posterior extremity of the calcaneum was amputated. The wound healed without infection and there was a good stump.

Chaput thinks that the resection of the posterior extremity of the calcaneum is very important. It shortens the length of the lever arm by means of which the weight of the body and the Achilles tendon makes the calcaneum basculate by carrying its posterior extremity up and the large apophysis down. In spite of the precautions taken in Chaput's case there was a slight elevation of the posterior extremity of the calcaneum and without such precautions the reversal would have been very marked. Horizontal intercalcaneum amputation therefore appears efficacious against reversal of the stump.

W. A. BRENNAN.

Rouvillois, H. P., Guillaume, L., and Basset: Primary Resection in Articular Wounds of the Knee (De la résection primitive dans les plaies articulaires du genou). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1364.

In 197 cases of articular wounds of the knee the authors performed primary resection 11 times. They think that primary resection should be reserved for cases of articular shattering. Partial resection with the ideal technique of arciform arthrotomy, appears applicable in a wide number of cases. Extended resection will give surprising results in many cases which from bone lesions alone appear condemned to amputation. Every doubtful case should be resected in the absence of important vascular or soft part lesions.

In dia-epiphysary breakages resection is the operation called for; this should be atypical and follow the lesion. The nature of the resection will be especially determined by the length of the attacked diaphysis.

In uni- and bi-epiphysary fractures the orthopedic value of resection is incomparable as it gives a maximum economy of the less attacked or intact epiphysis.

Whatever method of resection is adopted, the more rapidly immobilization is resorted to the better will be the results when the surfaces are strictly adapted.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Hatch, E. S.: An Operation for Hallux Valgus. *N. Orl. M. & S. J.*, 1917, lxx, 63.

The author states that the main etiological factors are bad shoes, pointed, tight, or short ones, or a combination of these errors. High heels force the foot forward and relax the anterior arch. Hypertrophic arthritis is a causative factor, as is also gout. Some authors claim that patients with a congenitally long great toe are more apt to have bunions than people with normal feet, but in his experience this has not been observed. An intermetatarsus is of such rare occurrence as hardly to be considered. These patients usually have, with

the bunion, a relaxed anterior arch with marked calluses under the metatarsal heads, and in some cases a plate designed to support the anterior arch will give some relief, but cases with much pain can be cured only by operation. The size of the bunion does not seem to be any index of the pain suffered by the patients nor of the degree of hallux valgus present and quite frequently the author has been asked to operate for cosmetic effect.

Hatch believes that a middle ground between the Wilson and the Porter technique seems best, and he has been performing the following operation for the last six years: A curved incision is made over the metatarsophalangeal joint of the great toe, with the base downward. The skin is dissected back and the bursa carefully removed. The head of the metatarsal is dissected free, and, with an osteotome, a cut is made half-way through the bone at right angles to the shaft, just back of the head. The osteotome is then removed and inserted in the center of the shaft and the inner half of the head chiseled off. Any rough edges that are present are then smoothed off. If the tendon of the extensor proprius pollicis is much shortened it is tenotomized or lengthened. This happens in a very small per cent of the cases. This leaves a good portion of the outside of the head to articulate with the first phalanx. The joint has not been injured, and all of the projecting part of the head has been removed. The leaving of half of the head, with its articulating cartilage, makes a better joint than would be secured by taking off the piece of bone at an angle. The subcutaneous tissue is united by catgut sutures and the skin sewed with silk-worm-gut. A pad of felt is put between the first and second toes and a light plaster cast applied, including the ankle, to protect the foot. The stitches are removed on the tenth day and the patient allowed up about the twelfth to the fourteenth day. This operation allows the patients to be walking in two weeks, and in eighteen or twenty days they are able to put on any ordinary shoe. It is very important for them to wear a shoe with a straight inside last, and Porter says, "If you cannot dictate the shoes, do not do the operation." Several of Hatch's cases will not wear a proper shoe and seem to be very comfortable in their more stylish types. In some cases, when the anterior arch is much relaxed, a spoon-shaped plate made of very light steel, 22-gauge, is necessary for complete relief.

PHILIP LEWIN.

Bastos and Ansart: A New Method of Bloodless Reduction of Congenital Hip-Joint Luxations (Un nuevo procedimiento de reducción incruenta de las luxaciones congenitas de cadera). *Pediat. espan.*, Madrid, 1917, vi, 178.

The technique of the author's method of bloodless reduction of congenital hip luxations is as follows:

1. The patient is placed face downward on the table, the affected limb hanging to one side of the table, but with the two tibial spines supported and

the pelvis maintained by the pressure of the hands of an assistant.

2. A movement of flexion is communicated to the thigh by gripping it with one hand while the other forces the descent of the trochanter by describing a circular trajectory until the thigh is found in the plane of the table or a little less and in a certain degree of abduction which will insensibly occur.

3. Pressure is made upon the trochanter from below upward until the jerk and crack are experienced which denote the introduction of the head.

These reduction maneuvers have given satisfactory results in a case cited by the author.

W. A. BRENNAN.

Lollini, C.: Contribution to Osgood and Schlatter's Disease (Contributo alla malattia di Schlatter e Osgood). *Policlín.*, Roma, 1917, xxiv, sez. chir., 298.

From a consideration of a case of Schlatter and Osgood's disease in a youth of 19 years in which there was a traumatism, Lollini finds that this disease does not originate either from a traumatism or from inflammation, but is due to an alteration in ossification through defective development. Such alterations in ossification render the tissues of the subject more vulnerable, and partial or total displacement of the tibial tuberosity easily results as the consequence of a trauma; but the disease itself is rather an anomaly of development in the ossification, perhaps a decalcification of the nucleus of the anterior tibial tuberosity, and in Lollini's case it was probably tubercular in nature. W. A. BRENNAN.

Osgood, R. B.: Communication from U. S. Army Base Hospital No. 5. *Am. J. Orth. Surg.*, 1917, xv, 668.

If a foreign body has perforated a joint and its tract appears to be reasonably clean, the joint is immobilized and carefully watched even in the presence of increased surface heat and a tight synovitis. At most, an aspiration is done, and the nature of the fluid and its bacteriology determined. Many of these cases quiet down in a surprisingly satisfactory manner.

In the case of a penetrating wound with the foreign body still present, actually in the joint or in the tissues involved in its mechanism, action is dictated by several considerations — the size and location of the foreign body, the reaction of the joint, the possibility that a part of the active joint symptoms have been caused by the inevitable trauma of transportation and by the temperature and general condition of the individual.

In general, it may be said that foreign bodies of any size, within a joint cavity proper or embedded in the articular ends of the bones near the cartilage line, should be removed at some time. It is often wise to allow the first traumatic reaction to subside before opening the joint. Under rest and complete fixation, they frequently quiet down quickly and

may then be opened more safely. If operation is undertaken, the external wound is excised, the joint opened, and after the foreign body has been found and removed, the joint is washed out for at least ten minutes with a weak bichloride or sterile normal saline or perhaps even the antiseptic solution devised by Dakin. The form most commonly used is the so-called eusol, in strength of 1:200 or 1:400. After thorough irrigation by means of a soft catheter tube inserted into the deepest recesses of the joint, the joint cavity is tightly closed with fine chromic catgut, and the external wound only partially sutured, or not at all, depending upon the severity of the infection and the tissue drainage.

A small drain of rubber tissue is left in, extending down to but not through the capsule. Many of the surgeons, especially at the casualty clearing station, are using, in addition, a substance known as "bip" (bismuth-iodoform-paraffine) in thick liquid or soft paste consistencies, leaving a small amount in the joint and wiping it over the external wounds and incised tissues. It is the antiseptic treatment returning. An article by Morrison gives a full description of the method which its originator considers the best. The author and his colleagues have had certain cases of iodoform and bismuth poisoning following its use, the former shown by mental disturbances and perhaps vomiting, the latter by a dark line at the margin of the gums and sometimes by real stomatitis. There seems to be a marked individual idiosyncrasy and susceptibility, but it is certainly often followed by these effects.

The compound fractures complicated as they all are by sepsis, call for the most efficient methods of fixation, which must at the same time provide adequate room for copious dressings and treatment by the Carrel technique. At the primary operation, when adequate drainage is provided and the tissues damaged beyond repair are removed, it has been proved to be an axiom never to remove even seemingly completely separated fragments of bone. The early or even late excisions of joints and the clean removal of bone fragments have not resulted in a quick subsidence of sepsis, nor has joint function or union of bony ends been favored. The results of these procedures are often deplorable.

Plaster-of-Paris dressings with wide openings bridged by loops of metal or plaster offer the most perfect fixation and greatest comfort to the patient. These are employed in specially difficult and painful cases. Their disadvantages in an English general evacuating hospital, where there are often periods of great rush are their time-consuming initial application and the practical certainty that they will be removed when they reach the home hospital. Thomas and Jones splints are admirably adaptable, easy to make, capable of quick application, can be supplied in large quantities to the front stations, and allow of comfortable transportation. They leave little to be desired. They have adopted combinations of these splints by which arms may be fixed in abduction and the patient made ambulatory, and

are constantly finding new ways in which the desired position and fixation may be obtained. There is every indication for the adoption of these unit types of splints by the American War Department. They have proved their worth and have every practical advantage. The author believes it will be a great misfortune to try experiments with

making all kinds of different splints, perfectly capable of being well used by their inventors, but not by the rank and file of army surgeons in the vast majority of cases of compound fracture. This well-nigh universal usefulness is the great advantage of these Thomas and Jones splints.

PHILIP LEWIN.

SURGERY OF THE SPINAL COLUMN AND CORD

Levings, A. H.: Remarks on Typhoid Spine. *Ann. Surg.*, Phila., 1917, lxx, 747.

The author gives a detailed case report of a man 30 years of age who had typhoid fever and three months following the onset and after convalescence he was taken with pain in the back and other evidence of spondylitis and fever of low grade. This was probably followed by an attack of cholecystitis. His case recovered by immobilization in plaster.

Bone and joint disease as a complication of typhoid are considered and the ribs, tibia, and spine constitute 70 per cent of all cases.

The differential diagnosis and pathology of typhoid spine are considered.

In the treatment thorough immobilization of the spine in extension bringing the cast well over the iliac crests is the first consideration. A period of rest in bed may also be necessary; fluids should be pushed. At times it may be necessary to drain the gall-bladder.

K. L. VEHE.

Lesser: Scoliosis Due to Asymmetry of the Limbs. *Muenchen med. Wchnschr.*, 1917, lxiv, No. 5.

Referring to reports which have recently been published on the tendency to a scoliotic attitude observed in amputated patients, Lesser reports some cases in which for many years there has been an asymmetric disposal of the vertebral column

owing to the atrophy of one arm while the healthy arm is well developed. The torsion of the vertebral column does not exceed a certain amount when the disposition is normal and its development is normal; but there is a true scoliosis with asymmetric disposal of the column whenever there are intercalated vertebrae present, or pathologic conditions in the intervertebral disks.

W. A. BRENNAN.

Bellot, V.: Rifle Bullet Tolerated in the Cauda Equina for Seventeen Months with Functional Recovery; Late and Fatal Development of Infection (Balle de fusil tolérée pendant dix-sept mois dans la queue de cheval, avec guérison fonctionnelle. Reveil tardif et fatal de l'infection). *Bull. Acad. de méd.*, Par., 1917, lxxvii, 749.

A soldier received a gunshot wound in the left gluteal region and showed paralysis of the lower limbs and of the bladder. After three months he was walking on crutches and soon resumed duty. Seventeen months after his injury the paraplegia and bladder paralysis reappeared. All reflexes were abolished, and there was a syndrome of a medullary section.

A lumbar laminectomy was done and the projectile extracted from the nerve-fibers of the cauda equina. There was improvement for a week, but the man died from an acute ascending myelitis.

W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Duroux, E., and Couvreur, E.: Nerve-Sections and Restorations (Sections et restaurations nerveuses). *Lyon chir.*, 1917, xiv, 515.

The authors review the history of nerve-suturing since Flourens made his first attempt in 1827. They have made an experimental investigation on dogs and find that sections of the great sciatic and external popliteal nerves give the following physiological conclusions:

1. The marked paralysis which the section of these nerves produces in human beings does not occur in dogs.

2. The immediate or early return of function is not the consequence of a real restoration, which

always takes place very slowly; and the existence of which can be established only by the thorough penetration of axis cylinders from the central end into the distal peripheral end.

3. Immediate suture of a divided nerve facilitates the restoration by favoring the growth of the axis cylinders. This proceeds at the rate of about 1 mm. per day, and it may require considerably more than a year to effect complete functional re-establishment.

Regarding technique of nerve-suturing, the authors recommend a lateral suture. Great attention is given to the previous excision of all scar tissue surrounding the nerve-fibers as to this may be

attributed trophic disturbances. Liberation of the nerve is usually followed by disappearance of such trophic troubles a long time before the return of motor-power. This the authors could verify in some clinical cases.

W. A. BRENNAN.

Allegra, S. P.: The Surgical Treatment of Wounds of the Brachial Plexus (Contributo alla cura chirurgica delle ferite del plesso brachiale). *Polislin.*, Roma, 1917, xxiv, sez. chir., 303.

Allegra gives the details of three cases operated upon for war injuries of the brachial plexus. The first case showed a superior radical paralysis of the fifth and sixth cervical branches, a typical Erb-Duchenne paralysis. The author noted that the compression symptoms of the sixth branch tended to become aggravated; also that there was no hope of a spontaneous regeneration in the other branch. He executed a neurolysis with satisfactory results.

The second case was a complex lesion of the plexus in which compression symptoms were evident. An early intervention showed the branches of the plexus compressed by an exuberance of an incomplete clavicular fracture. The third case

showed a complete radical paralysis with incomplete paralysis of the muscles of the arm and forearm. Operation showed that the plexus was compressed by an aneurism.

The author is of the opinion that in cases where an incomplete paralysis is clinically observed to become more pronounced, where the muscular tonus is gradually disappearing and muscular atrophy developing, surgical intervention should be made as early as possible, since a simple neurolysis permits the rapid functional and anatomic restoration of the compressed nerve-trunk.

While not an advocate of the early and methodic surgical exploration recommended by Delorme and Cestan, the author believes intervention should be as early as possible in cases of nerve compression, especially when the symptomatology in the region of the traumatized nerve-trunk becomes aggravated. Deferring operation to three or four months after injury when nerve interruption is complete, will make the prognosis less secure as there is much likelihood of a successful issue unless perhaps by a more extensive operative treatment.

W. A. BRENNAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Rabagliati, A. C. F.: Causes and Treatment of Cancer. *Med. Press & Circ.*, 1917, civ, 30.

Cancer, as a cause of death, has increased greatly in this generation and is still increasing at a rapid rate. The author's deductions as to cause and treatment are as follows:

1. It is not hereditary. If it were it would occur earlier. Only one-half per cent of all cases of cancer occur in children under five years of age.

2. It occurs more frequently among women than men in the proportion of about two to one.

3. Cancer increases in proportion to age up to sixty.

4. The causes must be such that increase as life advances, the chief of which are accumulations that gather volume from the material that goes into the blood through the digestion. The food acts powerfully as a modifier of the body. Waste products are deposited in the connective tissues.

5. Habits of women differ from men largely in regard to the food they eat, as is noted in their consumption of cakes, sweets, jams, etc. The author is of the opinion that an excess of food of any kind may be a cause of cancer, as the blood is thus loaded with waste material.

6. Cancer is a systemic affection.

7. The author advocates a change in habits of eating — less often and less amounts. He advocates

eating twice a day up to thirty or thirty-five years and then once a day.

8. Cancer is not to be cured by the use of drugs.

9. The author states that he has effected a cure in some cases by free excision of the growth, previously having given the patients only milk and barley water for a week, and then having them eat only once a day.

10. The author is a firm believer in the principle of a "life force," and that food is not used to keep up the heat of the body but merely to restore the waste.

C. A. BOWERS.

Cisernos, E.: The Pathogenesis and Treatment of Cancer (Hacia la patogenia y terapeutica del cancer). *Semana méd.*, 1917, xxiv, 1.

Since 1889 Cisernos has been treating cancer cases by electro-ignition. The treatment has always been empirical. It was only known that the results obtained from the electric spark were better than those obtained from the bistoury. The proof of this was shown in a case in which one-half of an epithelioma was extirpated by the bistoury and the second half by electro-ignition. Thirty days after completion of the operation it could be seen that the part treated by the bistoury was neoplastic, while that treated by electro-ignition was irreproachably healthy. This case was reported in 1907.

Cisernos now states that the treatment by electro-ignition is no longer empirical but is based on the fact that it is the only logical and efficacious method

of checking the evolution of the blastoma, the causal agent in the dissemination of cancer.

After a radical surgical operation the surgeon is not assured concerning a recurrence. Electrical cauterization will remove all doubts. If the neoplasm is reproduced after cauterization it is because the surgery was insufficient. Surgery, complemented by electro-ignition or electro-cauterization will cure 100 per cent of cases freely operable and many cases considered inoperable.

Regarding radium, in three years the author has not been able to find a single cured case in the clinics where radium treatment of cancer was carried out.

W. A. BRENNAN.

Kolischer, G.: Modern Cancer-Therapy and Its Results. *Interest. M. J.*, 1917, xxiv, 637.

Kolischer mentions 22 cases of carcinoma of various organs which have been "clinically cured" with no evident recurrence in from six months to three years. All these cases were inoperable and according to previous standards hopeless. He states that the best results may be obtained by a combined treatment, employing all the modern methods available. Progress in a given case may be made by radiation up to a certain extent, and further improvement achieved by the application of radium or mesothorium as well as injections of the enzyme into the tumor.

In cancer of the tongue if diathermy is administered previous to raying, the usual irritation stimulating the growth of the tumor is not present, though a definite curative result may not be obtained. In the involvement of cervical glands it is advisable to inject the glands with the enzyme first and destroy them with the diatherm after the reaction following the injection has subsided — then the treatment of the lingual tumor is started. Palliative results will be obtained in cancer of the tonsils and fauces both by diathermy and raying.

As diathermy in the mouth is exceedingly painful, and inhalation of ether dangerous on account of ignition, it is best to produce general anæsthesia by infusion of ether into the rectum. The oral and buccal mucosa are very susceptible to the influence of radium and mesothorium and great care in screening the adjacent surfaces should be taken. The same holds true in the rectal mucous membrane. The injection of enzyme seemed particularly beneficial in the treatment of cancer of the bladder, rectum, and prostate. In the treatment of viscera enclosed in the abdomen, the latter must be opened at a suitable place and the tumor anchored at the opening.

In uterine cancer it is important that the cavity is kept patulous so that the introduction of the radium can extend to the growth. Where the uterine cavity is elongated two capsules have to be employed at each sitting, one for the corpus and the other for the cervix uteri and portio vaginalis. In relapsed cases where the fornix vaginae is occluded by a tumor it is advisable to coagulate all the

accessible parts of the tumor by diathermy, so that a cavity will be formed by the sloughing for the proper introduction of the radium.

In cancer of the prostate and the base of the bladder it is well to precede the radiation by injection of the enzyme, which can be accomplished by forcing a long needle through the perineum, the course of the needle being controlled by an index-finger inserted into the rectum. L. R. GOLDSMITH.

Roffo, A. H.: The Miostagmin Reaction in Rats with Malignant Tumors (La reaccion de meostagmina en las ratas con tumores malignos). *Prensa méd. argent.*, 1917, iii, 377.

In February of this year Roffo and Miguenz published an account of the miostagmin reaction in cancer. The physicochemical alterations which are originated by the spot in contact with antigens and antibodies cause certain alterations in the superficial tensions which Oscoli and Izar used as a method of diagnosis in certain diseases. Roffo and Miguenz employed lecithin antigen and studied the reaction of 270 sera of distinct cancerous patients. The results were 85.72 per cent positive in carcinomata and sarcomata, rising to 100 per cent when ganglionic metastases existed. In cutaneous epitheliomata when there was no generalization positive results were obtained in only 35.28 per cent. Extirpation of the tumor modified the reaction which reappeared when there was a recurrence.

Roffo has extended his investigations to transplanted malignant tumors in rats and from a large series of experiments he deduces these conclusions:

1. Rats with tumors show a positive reaction which appears about the eighth day of development.
2. The region of development of the tumor, its volume and its histologic type, exercise no influence on the appearance of the reaction nor upon its intensity.
3. A positive reaction disappears on the extirpation of the tumor, but if it remains positive it is an indication of a possible recurrence.

W. A. BRENNAN.

Delaney, C. W.: The Present-Day Treatment of Tuberculous Abscesses and Sinuses. *Penn. M. J.*, 1917, xx, 717.

Delaney recalls the law that we must never open a cold abscess which communicates with a tuberculous focus, unless we can go to the bottom of it and clean out the primary focus.

Likewise, a tuberculous abscess should never be opened unless it is an imperative necessity, threatening life, as in postpharyngeal abscess, for opening at once admits a more virulent and dangerous type of infection.

Tuberculous abscesses are always encapsulated and should not have the encapsulating tissue disrupted, thus allowing the implantation of additional organisms into a mass of tuberculous material, which is an ideal pabulum for septic micro-organisms.

The tendency of tuberculosis, except in intestinal foci, is to heal. The focus is encapsulated and heals by cicatrization.

Tuberculosis itself never kills; that is the result of mixed infection. The treatment recommended is (1) early diagnosis, (2) treatment early and persistent, (3) absolute rest, i.e., manipulate as little as possible and not at all after diagnosis, (4) under strictest technique aspirate and inject the modifying solution of Calot:

Olive oil.....	2.5 oz.
Ether.....	1.25 oz.
Creosote.....	1.5 dr.
Guiacol.....	1.50 gr.
Iodoform.....	2.5 dr.

Aspiration and injection are repeated every ten days for six sittings; at the seventh merely aspirated and a compress applied. The walls will cicatrize and the cavity is thus obliterated.

During treatment the patient is kept at absolute rest and under the usual regimen for tuberculosis in any part of the body. After healing, other treatments for the primary focus may be instituted, such as the Albee bone-graft operation in spinal caries.

Tuberculous fistulæ are treated by injecting a paste which solidifies at body temperature and does not require a high temperature to melt it.

Calot's paste:

Camphorated phenol.....	1.5 dr.
Camphorated naphthol.....	1.5 dr.
Guiacol.....	3.5 dr.
Iodoform.....	5 dr.
Creosote.....	2 dr.
Lanolin.....	5 dr.
Spermaceti.....	13 dr.

This is liquid at 100° F. and solid at 99° F.

The sinuses are injected with this every seven days, using a large size urethral glass syringe.

The paste is melted in a water bath and the syringe so heated that the paste does not solidify. It is injected firmly but not under too great pressure, the communicating sinuses being held closed by the pressure of an assistant's finger until the paste solidifies.

After each injection the opening is protected by a thick gauze compress. The relief from discomfort and decrease in discharge are gratifying, and perseverance in this treatment will cure the fistula.

The usual hygienic treatment by rest, fresh air, food, and sunshine is carried out while the injections are being made.

Fistulæ are easier to prevent than to cure; 90 per cent of deaths in bone tuberculosis are due to the formation of fistulæ, 90 per cent of which it is possible to avoid. They arise from faulty treatment of tuberculous abscesses either by surgeons who operate on external tuberculosis and open abscesses, by those who never interfere and so allow abscesses to open spontaneously, or by those who puncture improperly.

L. R. GOLDSMITH.

Debat, F.: Dermo-epidermic Grafts and Their Application in War Surgery (Les greffes dermo-epidermiques et leurs applications en petite chirurgie de guerre). *Bull. Acad. de méd.*, Par., 1917, lxxviii, 82.

Debat refers to the value of dermo-epidermic grafts in many eventualities of war injuries, such as deep burns, amputation stumps, etc. He gives the method of preparing the wound for the reception of the grafts which are cut from the anterior face of the thigh. They are generally small. The author is of the opinion that following a careful technique which he describes, these grafts should regularly succeed whatever the extent or locality of the wound.

W. A. BRENNAN.

Douglas, S. R., Colebrook, L., and Fleming, A.: Skin-Grafting; a Plea for Its More Extensive Application. *Lancet*, Lond., 1917, cxciii, 5.

After the first phase of acute bacterial infection has been passed, the treatment of wounds should be directed to the closing of any cavity and the covering of the surface with epithelium rather than to the killing of the bacterial flora.

Most suppurating wounds after one to three weeks, pass into the raw-meat stage, in which stage secondary suture has often proved successful. However, many wounds do not lend themselves to plastic surgery as a result of extensive loss of skin. It is in these wounds that the healing process can be cut short by skin-grafting. The operation of skin-grafting as suggested in this communication is worthy of wide application. It can be done with local anæsthetic and be productive of good scars.

In 1869 Reverdin introduced the method of implanting tiny portions of skin upon granulating surfaces to serve as centers of growth.

In 1870 Steele improved upon this by cutting the grafts rather larger and thicker in order to obtain stronger and more elastic scars. His grafts varied in size from the diameter of a pea to that of a three-penny piece.

Both of these methods were given up in time because of the more striking results achieved by the Thiersch graft which in turn was found to have disadvantages in the uncertain adhering of grafts and often in the unsatisfactory scars obtained.

The authors have revived the Steele grafts which aim at making the transplantation of skin a reliable procedure with the use of local anæsthesia.

Local anæsthesia obtained by blocking certain nerves of the thigh with novocaine has been almost invariably employed. The external cutaneous nerve and at times the anterior crural are blocked with 2 per cent novocaine.

By taking a superficial hold of the surface with a towel holding forceps a small cone of skin is raised which is cut off horizontally through the base of the cone, the graft containing none of the fatty areolar tissue. The graft is then transferred to the wound and flattened out and the little wound from which the graft is taken is closed with a single shallow stitch. When possible the grafts

should be arranged over the wound surface so that less than 8 m.m. intervenes between them or between them and the wound edge.

Section grafting has been applied by removing a strip of skin 5 to 10 cm. long and 1 cm. wide, which is then divided into thin vertical sections with scissors and these small grafts placed over the wound.

When the wound has been covered with grafts a perforated oiled fabric is applied over the wound, after the wound has been moistened with a spray of Locke's solution and the fabric securely fixed with adhesive to the skin. A roller muslin bandage is soaked in hot Locke's solution and applied wringing wet by unrolling it to and fro over the wound, covering it with many thicknesses, which are held in place by several turns of the bandage round the limb. Over this oiled paper is placed, which in turn is firmly held by an outer bandage, in this way preventing evaporations, for it is essential to keep the wound moist. A simple splint is applied for keeping the part at rest. The dressing is changed daily down to the perforated oiled fabric, which at the end of a week is removed to determine the exact condition of the grafts, but it may be necessary to continue its use a few days longer.

The total number of transplantations was 33; 29 were of Steele's type and 4 were section grafts. Of the 29 Steele grafts 22 were autodermic and 7 were isodermic.

Of the autodermic Steele grafts, 80 to 100 per cent became adherent in 12 out of the 22 cases; 40 to 80 per cent became adherent in 7 out of the 22 cases; 5 to 15 per cent became adherent in 2 out of the 22 cases. In the remaining case the result was a complete failure.

Each graft constitutes a strong point in the scar, and has more elasticity and affords a better covering than naturally formed scars, the scars from Steele's grafts being less adherent to deeper structures.

Of the isodermic grafts, in 6 of the 7 wounds 80 per cent or more of the grafts took, the result being poor in the remaining case.

In section grafts, the result in 2 of the 4 cases was quite perfect.

The most favorable type of wound to graft is one which shows a clean, flat surface covered with small bright red granulations, painless on being touched.

A less favorable wound to graft is that in which the granulations are coarser, paler in color, less firm, tending to be œdematous and bleed on the slightest touch. From such wounds the discharge is abundant.

The conclusions are as follows:

1. Successful results can be obtained much more constantly.
2. The use of a general anæsthetic is dispensed with.
3. The raw surfaces left after the removal of the grafts, being closed with sutures heal rapidly and certainly.

4. The resulting scars are stronger, more elastic, and less prone to ulceration than those resulting from Thiersch grafts or from natural healing of wounds.

V. C. HUNT.

Daufresne, M.: Cicatrization of Wounds; the Use of Chloramine-T Paste for the Sterilization of Wounds. *J. Exp. Med.*, 1917, xxvi, 91.

The author draws attention to the fact, as shown in a previous communication, that a wound cicatrizes rapidly if the surface is sterile, and if it is more or less infected, the rate of cicatrization is slow or the wound enlarges. In order to obtain a convenient method for the sterilization of wounds, Daufresne has endeavored to prepare an antiseptic paste which will retain its aseptic properties.

It has been found that ointments and other fatty substances are inefficient when applied to wounds, because the bacteria and antiseptic are covered with fatty material which isolates them from each other and permits the bacteria to multiply freely. Hence the antiseptic paste must be soluble, and the bactericidal agent must be embodied in a substrate suitably chosen so that the whole constitutes a system physically homogeneous. On the other hand, the author states, to enable the antiseptic to act continuously the base should be absorbed slowly by the tissues in order to renew the surface of contact constantly. Neutral sodium stearate was used for this purpose because of the facility with which it is made antiseptic and also because it is not injurious to the tissues. As he states, it is well known that the slightly soluble sodium soaps, far from being irritating agents, are, on the contrary, soothing. Moreover, they give pastes sufficiently plastic for the dressing of wounds. One of Dakin's chloramines was selected as the bactericidal agent, and after many trials the following formula was used by Daufresne.

Neutral sodium stearate.....	86 gm.
Chloramine-T	4-10 gm.
Distilled water	1000 ccm.

Of the less soluble sodium soaps he considers it essential to choose those derived from saturated fatty acids and not having double ethylene linkages. The presence of such groups which readily take up the elements of hypochlorous acid (HClO) he believes, causes a rapid disappearance of chloramine. On the other hand, stearic acid is a product of sufficient purity and is easily procured; its sodium salt obtained by boiling the calculated amount diluted with caustic soda is aseptic.

Daufresne chose as an antiseptic to combine with the sodium stearate one of the substances studied by Dakin, known as chloramine-T, which is the sodium salt of toluene sodium p-sulfochloramide. His reasons for choosing this substance were its high bactericidal power, the absence of caustic action on the skin, the possibility of an exact estimation of its strength, and its stability at a high temperature, which allows the substances to

dissolve in a boiling solution of stearate. The question of using sodium hypochlorite was not considered because this product changes rapidly under the influence of heat, and especially because of the sensitiveness of soap solutions to the action of electrolytes.

The principal disadvantage of this paste is its poor power of preservation; numerous trials showed that 10 per cent of chloramine-T disappeared per month, the author states. Substances which might have rendered the paste more stable were either inefficient or lessened its keeping properties. The stability of the paste is limited by the stability of the solution of chloramine-T because the antiseptic is in solution in the paste.

Daufresne concludes that Dakin's toluene sodium p-sulfochloramide, mixed with sodium stearate, forms a paste sufficiently active and stable to be used in the treatment of wounds.

GEORGE E. BEILBY.

Carrel, A., and Hartmann, A.: Cicatrization of Wounds; Sterilization of Wounds with Chloramine-T. *J. Exp. Med.*, 1917, xxvi, 95.

The authors draw attention to a previous article in which it was shown that the presence of bacteria at the surface of a wound retards the normal process of cicatrization, and according to the nature and size of the infection, the curve representing cicatrization deviated from the calculated curve. In order to investigate the substances which are capable of influencing tissue repair, they state, it is, therefore, imperative that the wound should be kept in an aseptic condition, as no specific influence on the progress of healing could be attributed to the substance experimented with unless the possible action of infection was entirely eliminated.

Sterilization of a wound has been found to be easily effected by the application of Dakin's hypochlorite solution at the surface of the tissues under appropriate conditions of concentration and duration. In the experiments described in this article, the authors attempted to simplify the method by substituting for the instillations of Dakin's hypochlorite solution a paste designed gradually to yield up to the tissues one of Dakin's chloramines contained therein, and investigations were undertaken to ascertain whether this paste would be able to keep a sterile wound in an aseptic condition, as well as to sterilize an infected wound, and whether it would retard tissue repair.

The influence of sodium stearate containing 4 parts per 1,000 of chloramine-T was first tested on surface wounds which had been rendered almost aseptic by instillations of Dakin's hypochlorite solution, and in the first experiment a comparison was made of the effect on the bacteriological condition of a slightly infected wound of sodium stearate alone, and of sodium stearate containing 4 parts per 1,000 of chloramine-T. The authors' observation showed, on the one hand, that sodium stearate had no effect on a slightly infected wound, and, on

the other hand, that sodium stearate containing 4 parts per 1,000 of chloramine-T, produced surgical asepsis. The bacteria disappeared completely from the films taken from the portions of the wound treated with chloramine-T; whereas they were present in all the films from the part not so treated. Experiments were then undertaken to attempt to maintain in an aseptic condition wounds which had been rendered surgically sterile at the beginning of treatment.

Sodium stearate, the authors found, had no effect upon the bacteriological condition of a wound, but the addition of 4 parts per 1,000 of chloramine-T rendered it antiseptic. Their first experiment enabled them to compare the action of sodium stearate alone with that of sodium stearate containing 4 parts per 1,000 of chloramine-T. Wounds which had been previously sterilized could be maintained in an aseptic condition by 4 parts per 1,000 of chloramine-T, although in some cases reinfection occurred. For this reason the concentration of chloramine-T was increased.

Surface wounds, deep-seated wounds, and osseous cavities, which had previously been either completely or almost completely sterilized, were maintained for days and even weeks in a condition of surgical asepsis by the use of a paste containing 7 and 10 parts per 1,000 of chloramine-T. Slightly infected wounds were sterilized in the same manner.

Next, the authors attempted to sterilize wounds which were suppurating and more or less infected, and in some cases accompanied by fracture. This attempt was probably successful because the wounds used for the experiments showed but slight quantities of secretions and only a shallow layer of necrotic tissue. It was useless to attempt to sterilize severely infected wounds with a paste, for the volume of chloramine-T that could be applied was too limited. A large volume of an active substance was required to sterilize a wound which secreted great quantities of pus, for owing, on the one hand, to the dilution of this substance with the secretions, and, on the other, to its combination with the proteins contained in the pus, the concentration of the antiseptic was rapidly diminished. For these reasons the authors considered it essential that the antiseptic solution should be constantly renewed, so that the concentration would be sufficiently strong to effect the destruction of the bacteria. Therefore, the chloramine-T they found, could not sterilize a severely infected wound.

The concentration of the active substance contained in a paste they state, must at the same time be sufficiently weak to be innocuous to the tissues, and should not exceed 15 parts per 1,000. Thus, it was evident that if the secretions from the wounds were abundant, the substance could exert its action upon the micro-organisms for the space of only a few hours. For this reason the chloramine paste, they believe, should be applied only under the conditions specified in their experiments, that is, in

connection with moderately infected wounds which have been carefully washed with sodium oleate, and possess but slight quantities of secretion. Under these conditions the chloramine paste affected the complete disappearance of the bacteria and maintained the sterility thus secured for as long a time as wished. If the technique followed in the dressing was not exactly as described by the authors, reinfection occurred. If applied in this manner the chloramine paste was not injurious to the tissues, for the cicatrization curves of the wounds thus treated showed but slight modification from the calculated curves.

Chloramine paste makes it possible, therefore, the authors conclude, to keep wounds sufficiently free from micro-organisms so that the effect of substances which are believed to influence cicatrization can be studied. Under the conditions of their experiments the paste maintained the asepsis of a wound already sterile and sterilized an infected wound, and under the same conditions it caused no apparent modification of the cicatrization curve of an aseptic wound.

GEORGE E. BEILBY.

Vincent, A.: Cicatrization of Wounds; Bacteriological Asepsis of a Wound. *J. Exp. Med.*, 1917, xxvi, 83.

In a previous communication it has been shown, Vincent states, that even a slight infection prevents normal cicatrization, and experiments on cicatrization must be carried out on surgically aseptic wounds. The degree of asepsis can easily be obtained by the method already described by Carrel and Dehelly. Surgical asepsis differs widely from bacteriological asepsis, as the author states, and disinfected wounds which unite by first intention still contain numerous bacteria, particularly micrococcus epidermidis albus. However, he believes that the experiments carried out by Carrel and Hartmann have shown that the new method of wound sterilization frequently leads to bacteriological asepsis.

The object of the author's experiments was to determine to what degree wounds irrigated with Dakin's solution or treated with chloramine paste become bacteriologically aseptic. In the first series of experiments he undertook to ascertain what quantity of Dakin's solution or of chloramine-T is necessary to retard or prevent the growth of staphylococcus. This preliminary experiment he considered necessary in order to determine whether the quantity of antiseptic taken from the surface of the wound at the same time as the secretions was strong enough to inhibit the growth of the bacteria contained in the secretions.

Of 20 infected cases treated with Dakin's solution or chloramine paste, 7 were bacteriologically sterile, which proves, the author states, that in general, 35 per cent of the cases thus treated become bacteriologically aseptic. This degree of asepsis he does not consider necessary in order to suture the wound, the absence of bacteria in films

being sufficient, and complete sterilization of wounds, can, therefore, now be accomplished.

GEORGE E. BEILBY.

Hamburger, C.: The Open Treatment of Wounds. *Muenchen. med. Wchnschr.*, 1916, lxiii, No. 41.

Hamburger calls attention to the advantages possessed by the open treatment of wounds, which have been admitted by many leading surgeons.

The more evident advantages are the free flow of secretions from the wounds, the cessation of foul odors, and economy in materials. These are evident; besides suppuration which might persist for a year or more is shortened to months.

To apply the open treatment many improvised methods have been employed, but it is better to have a simple and economic instrument at hand. Hamburger uses a wire grating made of a very soft and flexible metal wire which can easily be modified in form to suit any region of the body. It is galvanized and can be boiled without rusting. It is fixed in place with adhesive strips; a piece of gauze wrapped at the lowest point receives the secretions. The wire grating protects the surface of the wound. It may be covered over with thin gauze to protect the wound from flies, etc., when it is desired to expose the wound to the open air.

W. A. BRENNAN.

Schall, J. H.: The Replacement of Morphine in Surgical Practice; Report of 110 Cases. *Long Island M. J.*, 1917, xi, 187.

The observations of Buerger in Bier's clinic on the replacement of morphine by pantopon in surgical practice induced the author to investigate the merits of the drug. In a series of 110 cases pantopon gave results superior to those obtained from morphine. It markedly improves the patient's pre-operative mental condition, diminishes the amount of anæsthetic, lessens cardiac and pulmonary depression, makes postoperative shock less frequent, decreases nausea and vomiting, and does not interfere with the voluntary expulsion of flatus. In this series post-operative urinary secretion was normal in all cases. The drug is administered as follows: pantopon grain $\frac{1}{6}$ one hour before operation to be repeated in thirty minutes, grain $\frac{1}{3}$ at the completion of operation to be repeated every six hours for twenty-four to forty-eight hours.

C. D. HAUCH.

Bainbridge, F. A., and Bullen, H. B.: The Hæmoglobin Value of the Blood in Surgical Shock. *Lancet*, Lond., 1917, cxciii, 51.

The author has previously shown that shock was accompanied by loss of plasma from the blood into the tissues. The loss of plasma diminishes the volume of the circulating blood but renders it more concentrated with consequent rise in hæmoglobin.

In man surgical shock is frequently associated with considerable hæmorrhage, and the normal reaction of the body to hæmorrhage is the rapid

absorption of fluid from the tissues into the blood, thus restoring the volume of the blood, although the blood becomes more dilute and the percentage of hæmoglobin is lowered.

In a patient suffering from shock and hæmorrhage, it seems, the percentage of hæmoglobin is the result of two opposing processes: shock which tends to concentrate the blood and hæmorrhage which tends to dilute it. A low hæmoglobin value may indicate that the patient is increasing his blood volume at the expense of his tissue fluids; whereas if the hæmoglobin value is near normal the physiological reaction to loss of blood is being counteracted by the tendency of shock to concentrate the blood.

The conclusion from five cases is that in shock, accompanied by hæmorrhage a normal or nearly normal hæmoglobin value indicates that the patient is unable to make up for the loss of blood by absorbing fluid from his tissues and intravenous injection of saline is desirable.

V. C. HUNT.

Cocci, I.: Postoperative Treatment of Surgical Diseases (Sur la thérapeutique post-opératoire dans les affections chirurgicales). *Lyon chir.*, 1917, ix, 489.

Cocci submits the results of studies made by him since 1906 in the postoperative care of surgically treated patients. This comprises both the local treatment of the operated region and the general treatment of the patient, and has been applied extensively during the present war.

The local treatment comprises: (1) abandonment of all chemical disinfectants and utilization instead of the physical action of high temperatures employed under anæsthesia by means of hot irons, shaped in various ways, which maintain the necessary temperature better than the thermocautery (This is done not for its effect on germs but on the diseased tissues.); (2) constant use of scrupulous asepsis in every detail; (3) very careful toilet of the contours of the wounds and suppurating cavities by removing stagnant secretions, necrosed filaments, cutaneous desquamatory débris, etc. The best means of obtaining this is by mechanical washing of the cavity by irrigation with warm sterilized water under pressure and occasional use of soft soap; (4) abolition of gauze, caoutchouc, or other drains unless in very great cavities due to abscess (empyema, etc.), in which cases, sterilized paraffin is introduced into the wound by glass syringes so that it penetrates into the smallest anfractuosités; (5) wide application of sterilized vaseline about the contours of the wound; (6) changing the dressings as rarely as possible unless there are special reasons; (7) immobilization and rest.

The author's guiding principle is not to interfere or hinder the evolution of the natural processes of the defense of the organism, and to favor such processes without doing anything contrary to nature's laws. After experimenting with an enormous number of disinfectants with a view to their

action on germs, he is convinced that they have no action or that they cause damage to the vitality of the tissues which is great when compared to their hypothetical germicidal action. After having tried all systems of drainage he thinks it is an illusion to believe in their pretended action of drawing pus from a depth, that the latter is effected by a different mechanism in spite of drainage, and that, therefore, the best way of draining an infected area is not to drain it at all. The paraffin infections by their non-adhesion keep the wounds and its interstices open and free and do not hinder the discharge of pus.

The general treatment of the patient should be directed to reinforcing the natural powers of defense of the organism. In grave conditions all efforts should be directed to the general treatment rather than to any local action on the diseased area. Biologic medication is the desideratum and especially treatment by a specific serotherapy directed against the germs cultivated from the wound. While awaiting this the author has used large doses of horse serum—from 10 up to 80 ccm. per day—endovenously or subcutaneously, as polyvalent sera have been found inconstant in their action.

The author's experience in war surgery during the last two years has confirmed his belief in the excellence of his methods in comparison with others in actual use.

W. A. BRENNAN.

Janeway, T. C.: Slight Variations from Normal Structure and Function, and Their Clinical Significance. *Canad. M. Ass. J.*, 1917, vii, 589.

Knowledge of disease has in our day been so popularized that large numbers of men, and still more of womankind, seek advice on the least suggestion of anything wrong with their physical or mental machinery, and demand that the most exhaustive examinations be made to reassure them that each and all of their organs and functions are absolutely normal. Periodical medical examination of the apparently healthy is being enthusiastically proclaimed by sections of the medical profession as the great means for preventing chronic disease and assuring an unheard-of longevity for the whole human race.

The problem is primarily one of prognosis, not of therapeutics, and development of prognosis as a science has lagged far behind that of diagnosis, and even behind the still halting treatment. It has been slurred over in textbooks and very rarely given any important place in the instruction of medical students.

To give a medical opinion is not an academic exercise. Its standards are not the standards of abstract truth, but of fidelity to fact combined with loyalty to the best interests of the patient or of the organization for which the examination is made. Utility is implicit in it. Examinations which go beyond the possibilities of useful application of the findings obtained are research and must be con-

ducted consciously as such, though the opportunities offered to conduct such incidental research should be embraced where possible. Apart from such research no method is so simple as to be worth employing if it can yield no valuable result for the patient, and none is too elaborate if it can save life or in the slightest degree shorten illness or point the way toward health. It is not scientific to employ every possible method of investigation in the examination of every patient, but is meddling, is usually dishonest in the unnecessary expense for the patient which it entails and, where thus employed, clouds, not clarifies, the judgment.

Department-store medicine, with all its popularity at the present day and its seeming extreme thoroughness, is not wise medicine unless it be directed by a master-mind capable of passing judgment on every one of the facts assembled, and he, himself, capable of applying the more important of the methods of investigation employed. It can no more be successful medicine, judged by the true standards of success, which in medicine are never commercial standards, than can a department store without a guiding and organizing mind, directing its policy and familiar with the bulk of its methods, be a business success. Whether he be an obscure country practitioner or a renowned city consultant, no man can be a good physician who does not form his final judgment of a case with the whole human problem before him as though he, himself, were in the patient's place. There is no better safeguard against inconsidered opinion and no sounder rule by which to solve that most knotty medical problem of what constitutes telling the truth to a patient.

A frequent mistake with patients, and an occasional one with physicians, is the substitution of an ideal of physical perfection for the normal standard of a human being subject to the changes and chances of this mortal life. Neither patient nor physician has a right to set up for the human body any type of unattainable perfection which cannot be found in nature.

The purpose for which the examination is undertaken must influence greatly the decision as to the significance of the findings.

EDWARD L. CORNELL.

Bulkley, K.: A Method of Precision for the Removal of Needles in the Hand; the Use of the Microphone. *Ann. Surg., Phila.*, 1917, lxvi, 19.

From a study of the records of 72 cases of needles in the hand or foot, the author concludes that the methods used at present are not very satisfactory since only 47 per cent were found at the first attempt. In 10 per cent the needle was searched for twice and not found, and in one patient five attempts were made before the needle was finally recovered. He believes that the majority of needles in the hand assume their final position almost immediately, although in one of his own cases, he

failed to locate it on account of the change of position after the X-ray was taken.

The method suggested by the author, and used by him in 25 cases of this type with but two failures, is dependent upon the use of the microphone. This instrument, suggested by Alexander Graham Bell in 1883, has a combined resistance of 3,000 ohms, thereby being far more sensitive than the telephone which has a resistance of but 75 ohms. One electrode goes to the patient's mouth or rectum and the other is attached to the knife or other instrument used in the search. Immediately after an X-ray has been taken, a half inch incision is made and a sharp needle in circuit introduced. An unpleasant clicking is heard when the metallic substance is touched, or an irregular grating if it is rubbed. The exploring needle is then replaced by an ear knife and the opening enlarged sufficiently to introduce a fine mosquito forceps, which is also introduced in circuit. The sense of hearing alone is employed. Contact has been obtained many times within ten seconds and the author has rarely consumed more than twenty minutes. GATEWOOD.

SERA, VACCINES, AND FERMENTS

Potel, G.: Recovery in a Case of Streptococcal Septic Pyæmia Due to Injection of Peptones: Nolf-Depage Method (Sur un cas de guérison de septicopyhémie a streptocoques par les injections de peptones: méthodes de Nolf-Depage). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1441.

The treatment of rebellious streptococcal septic pyæmia by injection of peptones was first reported by Nolf in July, 1916. Nolf reported 4 cases treated satisfactorily and Depage reported 4 others. Potel now reports a ninth favorable result.

The technique according to Nolf is:

1. Procure a bacteriologic peptone without odor and as pure as possible. Make a 10 per cent solution in sterilized water. Heat to 120°. After precipitation filter cold. Put up this solution in 10 ccm. ampoules which are again sterilized in an autoclave.

There are two methods of injection, subcutaneous and intravenous. The intravenous method is dangerous. It should be done slowly in from three to five minutes, watching the patient's pulse and face. If the patient's face becomes a reddish purple and he becomes oppressed the peptone injection should be stopped and 5 ccm. of camphorated oil injected. On account of this possibility Potel has discontinued the intravenous method and adopted the subcutaneous from which there is nothing to fear. The first injection should be dilute. If this is well borne 10 ccm. of 10 per cent solution may be injected the next day. The injections are then made every two days, the patient fasting. Nolf has recommended such injections also in hæmophilia, hæmoglobinuria, and meteorism.

W. A. BRENNAN.

Vallée, H., and Bazy, L.: Attempts to Vaccinate Man Against Tetanus (Essai, chez l'homme, de vaccination contre le tétanos). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1445.

The authors think that the methods available in the struggle against tetanus are still insufficient and inconstant. They have endeavored to realize an antitetanic vaccination. The best vaccine is the toxin itself and the authors have used a toxin which has a power such that one cubic centimeter is sufficient to cause the death of 4,000 kilograms of living matter. The toxin is mixed with an iodine solution, iodine 1 gr., iodine of potassium 2 gr., distilled water 200 gr., in the proportion of two-thirds of toxin to one-third of iodine solution. Experience having shown that such a mixture was well borne by animals the authors tried it on the human subject. Seven wounded patients were vaccinated, all of which had received several injections of antitetanic serum. The vaccination was subcutaneous in the thigh and was repeated three times at 5-day intervals, the dosage being 1, 2, and 5 ccm. respectively.

Experiments were also carried out in rabbits to determine what proper dosage might be used for man and also to determine what results could be expected. Two series of rabbits were inoculated, one lot with the same dosage as in the case of the human patients and the other lot with one-thirtieth strength dose.

The results of their experimental and clinical work leads the authors to believe that antitetanic vaccination is possible and simple, inoffensive and efficacious. They cannot yet judge the duration of the immunity which it confers, but it is renewable without risk of anaphylaxis contrary to the serum treatment. The authors are making further research.

W. A. BRENNAN.

Rosenberger, R. C.: Summary of the Wassermann Tests Done During 1916, in the Philadelphia General Hospital. *N. Y. M. J.*, 1917, cv, 1233.

Rosenberger reports the result of 5,106 Wassermann tests made as a routine procedure. Of these, 4,430 were performed with the blood serum and 676 with the spinal fluid. The ordinary routine technique was used, with three antigens and controls. Taking the total number of all specimens of blood submitted there was a general average of 27.4 per cent positive, while the spinal fluid gave an average of 22.2 per cent positive. (A large number were taken from the insane department.)

He finds that in the obscure cases with a doubtful history and in cases where long-continued treatment was carried out, that the cholesterinized antigen is far more sensitive and dependable than the ordinary alcoholic luetic antigen.

In his opinion the Wassermann test is the most reliable routine laboratory test for the diagnosis of syphilis and for the study of cases under treatment. He warns one to be careful in pronouncing a case cured after the Wassermann has been negative.

He states that errors in the reading or recording of reactions may occur just the same as in any other scientific procedures, but where the antigen is made carefully, where titration is done regularly, and where the control of each reagent is properly made, then there should be no great variation in the end-result of this test.

G. W. HOCHREIN.

BLOOD

Rosenthal, G.: Clinical Blood-Transfusion—Bivinous Hæmosaline Technique Without Anastomosis (La transfusion sanguine clinique: Technique hémosaline biveineuse mensuratrice sans anastomose). *Bull. Acad. de méd., Par.*, 1917, lxxvii, 10.

In addition to the mechanical function of blood-transfusion in supplying the void in the vessels, the specific function is to excite hæmatopoiesis. For this specific function a sufficient quantity of blood must be injected but it need not be considerable. The mechanical function is fulfilled by a saline injection.

Rosenthal's procedure has the above in view. A needle is introduced into an elbow vein of the recipient. The rubber tube of a flask of isotonic sterile salt solution containing from 500 to 1000 ccm. is adapted to the needle. An assistant watches and regulates the flow of this.

The operator is conveniently placed between the donor and the recipient and furnished with a number of glass syringes, each of 20 ccm. capacity, thoroughly sterilized. A very large needle is introduced into a vein of the donor's elbow and adapted to one of the syringes. This will fill in four seconds. The operator withdraws the syringe rapidly and fixes it to the needle in the recipient's arm, the assistant having meantime suspended the saline flow. The whole maneuver occupies only about 10 seconds. This is repeated five or six times. The donor's arm is attended to by a second assistant who regulates compression, etc.

The loss to the donor is small and the risk is slight. The author believes that the procedure extends the field of usefulness of transfusions.

W. A. BRENNAN.

Hédon, E.: Transfusion of Blood Rendered Incoagulable by Sodium Citrate (Sur la transfusion du sang rendu incoagulable par le citrate de soude). *Presse méd.*, 1917, p. 409.

Hédon describes experiments on rabbits, the result of which leads him to conclude that transfusion of blood rendered incoagulable by trisodium citrate is without danger and restores exsanguinated animals. If the method is employed clinically the technique is simple. It is sufficient to puncture one of the donor's veins and to aspirate a certain quantity of blood with a syringe into the body of which the sodium citrate has already been introduced. The injection is then made into the recipient with the same syringe fortified by the needle, the injec-

tion being made slowly and without fear of coagulation.

Since Hédon's article went to press he has learned that Stansfeld in England has recently published a report of 29 transfusions with sodium citrate; and also that Weil in America had already in 1915 experimentally demonstrated the innocuity of this procedure.

W. A. BRENNAN.

BLOOD AND LYMPH VESSELS

Cuneo, B.: Double Aneurism of the Primary Carotid Transpierced by a Bullet (Double anévrisme de la carotide primitive transpercée par une balle). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1456.

A soldier received a bullet which entered a little above the right clavicle and issued about 2 cm. to the right of the spiny apophysis of the second dorsal. He showed symptoms of an arterial aneurism of the base of the neck. The lower part of the right primary carotid was removed, it being necessary to ligature the internal jugular and the lower thyroid. The man recovered. The resected piece showed two small hæmatomata, one about the size of a cherry was on the anterior face of the artery, the other somewhat smaller being on the posterior face. Each was in communication with the lumen of the vessel. The bullet apparently passed through the artery respecting its lateral walls.

W. A. BRENNAN.

Cuneo, B.: Seven Cases of Arteriovenous Aneurism of the Femoral Vessels (Sept cas d'anevrismes, artério-veineux des vaisseaux fémoraux). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 415.

Five of the 7 cases of femoral arteriovenous aneurism operated upon by Cuneo were of the classical type with the arterial and venous orifices juxtaposed or united by a canal of varying diameter. In the other two cases the arterial orifice opened into a large sac which discharged by multiple orifices of small diameter. In such cases if the arterial orifice is small there may be a relative stagnation in the large sac favoring coagulation. If the arterial orifice is large and the sac outlets small there is danger of a sac rupture. The two cases corresponded to these types.

In recent cases there exist two very distinct varieties of arteriovenous aneurism, one characterized by the absence of dilatation of the superficial veins and with an almost normal venous pressure, the other by ectasia and an arterialization of the superficial veins as well as by a very high venous pressure. The distinction between these two varieties is unquestionably due to the action of the valvular system; so long as this action is sufficient the arterial wave cannot be transmitted beyond the first valvular segment; when the valves have broken down the circulation disturbances become considerable. It is important to distinguish between these physiological types because the difficulties

and results from operation differ in the two cases. The second type is the natural outcome of the first and the period of tolerance depends principally on the size of the arterial orifice and the character of the individual valvular apparatus.

The method of operation followed by Cuneo in his 7 cases was suture of the vascular orifices in 2 cases, extirpation of the communicating segments in 3 cases; quadruple ligature in the immediate neighborhood in one case; and opening of the sac and ligature of an ulcerated arterial trunk in one case. All 7 cases recovered.

Cuneo thinks that the simplest operative course to follow is as this: To clearly define the situation of the aneurism by finding the intersection of the line uniting the orifices of entry and outlet of the projectile with the line indicating the course of the artery. To disclose the artery by an incision giving plenty of light and directly aimed toward the aneurism. If it is a case where there is no valvular insufficiency, the disclosure is easy, but if there is valvular insufficiency there may be considerable hæmorrhage. It is then useless to waste time in placing forceps. The principal trunks must be seized, disengaged from their position and compressed between two fingers even at the site of the aneurism. Hæmorrhage will cease almost by magic. A few forceps will secure hæmostasis. Two clamps are then placed immediately above and below the aneurism. These, generally, but not always, realize a complete hæmostasis, but in any case sufficient to enable the two vessels to be isolated. The disposition of the orifices should then be examined to see if suture is possible or not. If this is too difficult, extirpation of the injured vascular segments may have to be resorted to or a simple section of the two vessels. The operation is ended by ligature of the four ends.

W. A. BRENNAN.

Cole, H. P.: Laceration of the Inferior Vena Cava; Repaired by Suture; Recovery. *Ann. Surg.*, Phila., 1917, lxvi, 43.

An investigation of the literature discloses very few instances of extensive laceration of the inferior vena cava with recovery. The author reports one case from his personal experience in which the patient is alive and well two months after operation. In removing a rapidly growing tumor from the retroperitoneal space on the right side, two longitudinal rents were made, one about 3.5 cm. and the other about 1 cm. in length. The hæmorrhage was temporarily controlled with a gauze pack and although the patient was almost exsanguinated, the removal of the tumor was accomplished. The two tears in the vena cava were then found and a Pean clamp placed on the vessel below the rents. With a small gauze sponge, the slight oozing from above was controlled while the lacerations were whipped over with a single stitch of fine catgut. There was very slight oozing when the clamp was removed, and the space was loosely packed with

iodoform gauze. Intravenous salt solution was given and, barring the first twenty-four hours, the patient made an uninterrupted recovery. There was quite extensive oedema of the right leg ten days after the operation, but this disappeared ten days later.

GATEWOOD.

Cameron, H. C.: Status Lymphaticus from the Clinical Standpoint. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Dis. Child.*, 133.

Two contrary opinions as to the interpretation of the enlarged lymphoid tissue in this condition have their adherents, and Cameron wishes to suggest a third. In children dying suddenly, whose bodies have not been emaciated and dehydrated by prolonged illness, this condition is found in the post-mortem room of Guy's Hospital in a proportion of more than 40 per cent. He suggests that no matter where the lymphatic glandular tissue is hypertrophied and swollen, the explanation is the same, and that the hypertrophy may be regarded as the evidence persisting after death, of chronic irritation in the corresponding mucous membranes by persistent, though perhaps quiescent, catarrhal reaction, the enlarged glands remaining as evidence of its presence during life. The term "status catarrhalis" may be used to describe a condition which is the clinical analogue of the postmortem condition, status lymphaticus. A minute description of the appearance and symptoms of such patients is given. They are in reality atrophic children who have retained an undue amount of fluid in the water depots of the body. As to treatment Cameron considers a less watery diet with reduction of the starches and sugars best. He advises skim milk, meat, fish, eggs, green vegetables, and fruit.

His conclusions are as follows:

1. The lymphoid overgrowth so commonly found postmortem in children is no more than an enlargement from the irritation of chronic catarrh in the corresponding mucous membranes.
2. Such children during life show evidence of faulty nutrition or infection of all epithelial structures, hair, skin, teeth, conjunctiva, and the mucous membranes of respiratory and intestinal tracts.
3. There is usually present a characteristic wateriness of the tissues, which is dependent to some extent upon excessive carbohydrate feeding, which is a main cause of the vulnerability to infection.
4. Local treatment of the catarrhs alone is likely to be inefficacious, and must be accompanied by a systematic attempt to bring about the process of dehydration and improve the nutrition of the tissues.
5. The status catarrhalis in the sense defined is a predisposing cause of rheumatism and tubercle, and carries with it a liability to sudden death at the onset of virulent infections, such as pneumococcal infections, measles, or diphtheria.

CARL R. STEINKE.

Hamman, L.: Milroy's Disease. *Med. Clin.*, North America, 1917, i, 182.

The patient, a boy 14 years of age, came complaining of swelling of the right leg. In August, 1915, he fell from a wagon and the next night the leg became swollen and very red. The boy was unable to walk for ten days. The swelling continued three weeks and never totally disappeared. In June, 1916, he again slightly injured the leg which became swollen and inflamed. The leg still remained somewhat swollen after the acute symptoms disappeared. The boy showed marked retardation of mental development, but physically was short, stocky, and well built. The general physical examination was negative except for the right leg which was about twice the size of the left, the swelling being mostly below the knee. The oedema was firm and brawny. The eye-grounds were negative and the urine normal. He gets about very comfortably with a tight bandage on the right leg. His mother was found suffering with a similar condition as was also her sister. The treatment was palliative during the acute attacks and compression bandage during the interval.

CARL R. STEINKE.

POISONS

Olson, G. M.: Argiria Localis Due to Organic Silver Preparations. *J. Am. M. Ass.*, 1917, lxi, 87.

Olson summarizes his studies as follows:

A permanent and unsightly pigmentation may follow the local use of the various organic silver preparations, even if freshly prepared. The dark brown silver deposits appear bluish green or slate color through the uninvolved translucent epidermis.

Solutions of these salts should never be forcibly injected into any cavity or canal, and should not be applied where skin or mucous membrane is not intact.

The prognosis is not very hopeful. Blistering and electrolysis are of possible value in inducing an inflammatory action which favors absorption of the silver deposits. Hexamethylamine should be tried in every case.

ALBERT EHRENFRIED.

Mellon, R. R.: A Study of the Diphtheroid Group of Organisms with Special Reference to Their Relation to the Streptococci; Characteristics of a Peculiar Pleomorphic Diphtheroid. *J. Bact.*, 1917, ii, 81.

The isolation of a diphtheroid bacillus possessed of unusual morphologic and biologic characteristics not only prompted the author to make an intensive study of this strain but also directed his attention to a fundamental consideration of the entire group of diphtheroids, having as an object their systematic arrangement into sub-groups. He examined over a hundred strains of these organisms from different sources, some isolated by himself and others obtained from bacteriologists in this country and abroad, representing most of the peculiar types which have been noted in the literature in recent

years; and by excluding those forms which were apparently alike he finally selected forty-five representative strains which form the basis of the present paper.

As the principal criteria for this classification he has made use of the complement-fixation and sugar fermentation tests; nevertheless he has simultaneously studied the morphologic and other cultural characters of the strains and as far as possible correlated them with the immunological and fermentative reactions.

In addition to the classification of the diphtheroid group this study has opened up to the author another problem of co-ordinate importance, viz., a hitherto unsuspected group-relationship between the diphtheria group as a whole and the streptococci, which is exemplified in the unusual strain of diphtheroid bacillus to which the author has referred.

In view of the length of the report the author has divided it into three parts, the first of which occupies itself mainly with the strain in question and its relation to the streptococci, while the second division deals with the cultural relations and the classification of the sub-types of the diphtheria group itself, and the third with immunologic data.

Strain 1 of his series was representative of a sub-group of diphtheroids which has received scant recognition in the literature. Its pleomorphism is rivaled by that of the enterococcus to which it is closely related, he states. The so-called bacillus hodgekinii although very pleomorphic did not show the protean morphology of this strain. The author feels that the evidence regarding its causal relation with the unique pulmonary condition from which it was isolated is adequate. The fact that it was isolated from the lung in pure culture several weeks before the patient died, and that his serum gave positive agglutinin and complement-fixation reactions, he believes, is very suggestive. Demonstration of the bacillus in the colonies imbedded in the increased connective tissue of the alveolar walls, the lack of fibrin plugs, indicating pneumococcal infection, the absence of the tubercle bacillus or its tissue lesions, the lack of dust in sufficient amount to give rise to the condition, the author states, form with the serum reactions quite convincing evidence of causal relationship.

The pathogenicity of this organism for laboratory animals and its close relation to the streptococcus group, seemed to him to amplify the facts given above. Had the organism been injected into animals immediately after it was isolated, the chances for developing pulmonary lesions would have been much greater, he thinks, as Rosenow has convincingly shown in the case of the streptococcus. The very fact that it was "nothing but a diphtheroid" relegated the culture to the ice-chest until a convenient season arose for its testing.

The author has already described some of the cardinal characteristics of this strain (1916) and has pointed out its probable relation to the streptococci. The erythema nodosum strain also belongs

to this group, he states, as well as others in the series later described in this present study. The immunological reactions, of both agglutinins and complement-fixing bodies are further evidence for the same contention, he believes. Not only morphologically and culturally, but biologically as well, he found this strain to have much in common with the streptococci, and a thorough study demonstrated that it represented a group of organisms standing in an intermediate position between the diphtheroid and the streptococcus groups.

GEORGE E. BEILBY.

Frankau, C. H. S., Drummond, H., and Neligan, G. E.: The Successful Conservative Treatment of Early Gas Gangrene in Limbs by the Resection of Infected Muscles. *Brit. M. J.*, 1917, i, 729.

The authors give the details of 14 very interesting case histories which bear out the advisability of resecting infected groups of muscles or single muscles or even groups of fibrils in gas bacillus infection because this disease spreads in such a characteristic manner.

Cuthbert Wallace's conclusions are reviewed:

1. It is rare to meet gas gangrene without muscle injury.
2. It is chiefly a disease of muscles and is rarely dangerous unless muscle is involved.
3. The lesion in its early stages may be described as a longitudinal one, running up and down the wounded muscles from the seat of the lesion. Muscles or groups of muscles are involved while others escape.
4. It is rare to find all the muscles of a segment of a limb involved, save in a segment distal to one in which the main blood supply has been cut off.
5. There is little tendency of the infection to pass from one muscle to another.

Resection is continued until muscle is reached in which (1) the color is unchanged, (2) the contractility normal, and (3) a good blood-supply is indicated by free bleeding.

This is a conservative method of treatment and has saved lives where amputations would have been fatal, a fact brought out by a review of the case histories.

The after-treatment is supportive: locally eusol, by the Carrel technique; saline, and peroxide.

K. L. VEHE.

McNee, J. W., and Dunn, J. S.: The Method of Spread of Gas Gangrene into Living Muscle. *Brit. M. J.*, 1917, i, 727.

Gas gangrene is essentially a muscle disease and the authors have never seen it commence where muscle injury could be excluded.

The disease may commence within a surprisingly short time, prove fatal with astounding rapidity, as, for example, an onset in three and one-half hours and death in twelve hours after injury.

If a main arterial trunk is cut massive gangrene

occurs. This involves muscles from end to end simultaneously. But with an intact blood supply the spread is along individual muscle-fibers from end-to-end, while neighboring fibers may be untouched.

The method and cause of the characteristic spread were studied microscopically in material that had been obtained absolutely fresh to avoid the rapid postmortem changes. The changes followed from living to gangrenous muscle, loss of normal staining reaction, swelling of fibers, vacuolization between fiber and interstitial tissue, with finally complete disintegration of structure.

The vacuolization noted above is not due entirely to gas, the authors say, but to a toxic fluid which kills the muscle fiber; this in turn then furnishes a culture medium upon which the gas bacillus lives as a saprophyte to produce more of the toxic fluid and gas.

In their experimental work the authors expressed the fluid from a human muscle, passed it through a Berkefeld V filter and injected it into rabbits. Marked local necrosis resulted, tending to bear out the theory that the cause of spread along fibers is the toxic necrosis producing fluid formed from the dead muscle by gas bacilli living as saprophyte.

K. L. VEHE.

Chavasse, P.: Statistics of Cases of Tetanus Observed in the War Zone from Nov. 1, 1915, to Feb. 1, 1917 (Statistique des cas de tétanos observés dans la zone des armées du 1^{er} Novembre, 1915, au 1^{er} Février, 1917). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1249.

The statistics of Chavasse are collected from the reports of the chief of the medical staff of the French field armies and comprise nearly all cases of tetanus occurring at the front between Nov. 1, 1915, and Feb. 1, 1917. The statistics do not indicate cases occurring in the interior hospitals, etc.

The cases are included in three categories: (1) Tetanus occurring following accidental lesions or after current surgical operation; (2) tetanus occurring as a result of frozen feet (trench-foot); (3) tetanus due to gunshot wounds.

During the period under consideration 213 cases were reported by the armies at the front, 29 being of the first variety, 38 of the second, and 146 of the third. Of the 29 cases of tetanus, accidental and otherwise, 4 had received a preventive injection — 2 died and 2 recovered. Of 25 cases which had received no preventive injection, 16 died. Of the 38 cases of frozen foot tetanus there had been no preventive injection in 6 cases. All died. Thirty-two cases had received from 1 to 3 injections. These cases gave 29 deaths and 3 recoveries.

Of the 146 gunshot tetanus cases 9 had received no injections. These gave 6 deaths and 3 recoveries. There were 137 postserum cases with 107 deaths, 5 of which might be imputed to other causes.

Chavasse's study includes statistical details under the following heads:

1. Distribution according to the region of the injury.
2. Influence of the time of injury.
3. Influence due to the time of preventive injection.
4. Tetanus consecutive to delayed surgical intervention.
5. Special and abnormal form of tetanus.
6. Trismus from the prognostic standpoint.
7. Duration of tetanus in cases followed by death.
8. Influence due to the treatment.

The general conclusions drawn by Chavasse from his detailed study are:

1. If preventive injections of antitetanic serum employed in gunshot wounds do not always prevent the development of tetanus, they have incontestably demonstrated their efficacy in bringing about a very notable diminution in this formidable complication. But it cannot be held as an unfailing prophylaxis.

2. The gravity of tetanus has been shown to be in accord with the gravity of the local lesions. It has been especially prevalent with cases of frozen feet. The gravity at least in war injuries appears to diminish according to the number of preventive injections even though the wounds are very extensive.

3. The prophylactic dosage has not always been proportioned to the gravity of the wounds. The usual dose of 10 ccm. ought be doubled or even trebled at least for the first injection in the case of very extensive wounds or dirty wounds especially when foreign bodies are present. In wounds of medium gravity, if the first dose has been one of 30 ccm. the repeated doses should be from 10 to 15 ccm.; but if the first dose has only been 10 ccm. then successive doses should be stronger, say from 20 to 30 ccm. at seven to eight-day intervals. This will avoid anaphylaxis.

4. In frozen foot with phlyctenular ulceration or sphacela, the first dose should be 20 to 30 ccm., renewing with from 10 to 15 ccm. or even 20 ccm. in severe cases every eight days till recovery.

5. In order to fortify against late postoperative tetanus it is necessary, according to Bérard and Lumière, to make a preventive injection before any surgical operation whatever. The dose should be 10 to 20 ccm. according to the importance of the operation.

W. A. BRENNAN.

Cammaert, C. A.: Treatment of Tetanus by Intravenous Injections of Magnesium Sulphate (Over de behandeling van tetanus met magnesium sulfaat intraveneus ingespoten). *Nederl. Tijdschr. v. Geneesk.*, 1917, i, 158.

The author has obtained good results from intravenous injections of magnesium sulphate in a case of tetanus. The severe tetanic contractions vanished almost immediately after the first injection. Recovery was effected within eight days.

The intrarachidian and subcutaneous use of magnesium sulphate has accompanying dangers,

as it affects the heart and respiration; but when used intravenously elimination is rapid. In the case reported where there was recovery 50 cm. of a 10 per cent solution of magnesium sulphate were injected twice daily, 15 injections being made. At the same time subcutaneous injections of morphine and chloral were given. The author is of the opinion that magnesium sulphate injections might be successfully used in the crisis of eclampsia, uræmia, etc.

W. A. BRENNAN.

Bull, C. G., and Pritchett, I. W.: Toxin and Antitoxin of and Protective Inoculation Against Bacillus Welchii. *J. Exp. Med.*, 1917, xxvi, 119.

This study of the pathogenicity of infection by the group of bacillus welchii has followed from several fortuitous circumstances. First, there was the insistent problem, only partially solved by the improvement in the antiseptic treatment of wounds, of gas bacillus infection following shell and bullet wounds everywhere in the war; second, there were available to the authors several cultures of bacillus welchii isolated during the summer of 1916 on the western battle front by Simonds, who presented them to the Institute; and finally and especially, the authors state, Flexner's wish that with these cultures the subject of gas bacillus infection of the pigeon which he had observed many years before at the Johns Hopkins Hospital should be reinvestigated, as, in his opinion, the process in that species of animal epitomized the pathologic effects occurring in gas gangrene in man, and because he believed that a better understanding of the one condition would serve to explain many still obscure points in the other.

The main part of their experiments was made with five strains of bacillus welchii, of which four were obtained through Simonds and the fifth isolated by the authors from a piece of clothing which had long been worn.

In the authors' opinion the experiments presented appeared to admit of one interpretation only, namely, that the welch bacilli, under suitable conditions of growth, produced an active exotoxin, to which their pathogenic effects were ascribable. The toxic product, moreover, acted upon the local tissues and the blood in a manner identical with the action of the cultures. With the toxic product animals were immunized actively and yielded an immune serum which neutralized the toxin perfectly and in multiple proportion. The toxic bodies seemed to be at least two in number: one causing blood destruction, hence an hæmolysin, and the other acting locally on the tissues and blood-vessels, causing œdema and necrosis and probably exerting general toxic action in addition. The part each plays in bringing about the lethal effect, the authors believe, seems to be determined by the manner of inoculation: to bring out the hæmolytic action intravenous injection was indicated; to bring out the locally destructive action, subcutaneous or intramuscular injection was required.

Five cultures of bacillus welchii were studied and compared by the authors, four of which as stated came from infected wounds in the western theater of war, and one was obtained from a personal article of clothing. Each culture possessed the essential characteristics ascribed to that group of bacteria.

The infectious processes caused by the five cultures in rabbits, guinea pigs, and pigeons, were local in character; and very few or no bacilli entered or were found in the general blood stream during life or immediately after death.

Glucose broth cultures, injected intravenously, were fatal to rabbits. Death occurred almost immediately or after a few hours. Agglutinative bacterial emboli were ruled out as the cause of death, as was an acid intoxication. The fluid part of the culture acted in the same manner as the full culture and irrespective of neutralization with sodium hydroxide.

The full cultures and supernatant fluid were hæmolytic when injected directly into the circulation of rabbits and pigeons, and the acute death produced was ascribed to a massive destruction of red corpuscles.

The passage of the fluid portion of glucose broth cultures through Berkefeld filters reduced materially the hæmolytic and poisonous effects.

Cultures of the welch bacilli in plain broth to which sterile pigeon or rabbit muscle was added were highly toxic, and the toxicity was not noticeably diminished by Berkefeld filtration. The filtrates were hæmolytic when injected intravenously and inflaming and necrotizing when injected subcutaneously and intramuscularly. The local lesions produced in the breast muscles of the pigeon closely resembled those caused by infection with the bacilli.

The toxicity of these filtrates was not affected by neutralization with sodium hydroxide, but was materially reduced by heating to 62°C. and entirely removed by heating to 70°C. for 30 minutes.

Successive injections of carefully graded doses of this toxic filtrate in pigeons and rabbits gave rise to active immunity. The blood taken from the immunized rabbits was capable of neutralizing the toxic filtrate *in vivo* and *in vitro*. The filtrate was therefore designated as toxin and the immune serum as antitoxin.

The antitoxin neutralized the toxin in multiple proportions. Hence the latter seemed to possess the properties of an exotoxin. Moreover, it neutralized the hæmolytic as well as the locally injurious toxic constituent.

Antitoxin serum prepared from a given culture of bacillus welchii was neutralizing for the toxin yield by the other four cultures of that micro-organism.

The antitoxin was protective and curative against infection with the spore and the vegetative stages of bacillus welchii in pigeons. The limits of the protective and curative action are in course of investigation by the authors. GEORGE E. BEILBY.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Menten, M. L.: The Alkalinity of the Blood in Malignancy and Other Pathological Conditions, Together with Observations on the Relation of the Alkalinity of the Blood to Barometric Pressure. *J. Cancer Research*, 1917, ii, 179.

In nearly all cases of cancer and sarcoma examined the author found alkalinity of the serum greater than that of serum of normal individuals. High alkalinity of serum in suspected cases is therefore another added reason for a diagnosis of cancer. The author suspects that increased alkalinity may be a causative factor in cancer. MAX KAHN.

Williamson, O. K.: A New Physical Sign in Pneumothorax and in Pleural Effusion. *Lancet*, Lond., 1917, cxciii, 13.

The sign consists in the fact of the existence of a diminished blood-pressure in the leg as compared with that in the arm on the same side, a difference of at least 10 mm. and at times 20 mm.

In normal persons the blood-pressure in the arm and leg is practically the same. The presence of this sign is probably explained by pressure of the distended pleura by liquid or gas pressure upon the descending thoracic aorta as it lies on the vertebral column, causing a diminution in systolic pressure distally to the compressed area.

In children the sign is not apt to be present, which may be explained by the fact that the chest walls are less rigid than in older subjects. In this series children with effusions in which there are higher leg readings resulting from thickened arteries or aortic incompetence are not included.

This series includes 13 cases, among which there were 6 cases of pneumothorax, 5 of which showed a difference averaging 16.5 mm. In 3 cases the difference ranged from 23 to 27 mm. In 5 out of 7 cases of pleural effusion there was a difference averaging 12.5 mm., in one case it reached 35 mm.

V. C. HUNT.

Baldwin, A.: Some Mistake in Diagnosis. *Med. Press & Circ.*, 1917, ciii, 510.

In Baldwin's discussion of the mistakes in diagnosis the following deductions are made:

1. In neuralgia of the head, neck, and breasts, discover if the cause is an exposed nerve in a tooth.

2. Paroxysmal cough may be caused by a foreign body or cerumen in the ears.

3. If the temperature does not fall to normal in the usual time after pneumonia, look out for empyema.

4. Never accept a patient's own diagnosis of piles, or you may miss condyloma, papilloma, epithelioma, or prolapse or carcinoma of the rectum.

5. In an apparent case of rheumatoid fever in children, look out for acute osteomyelitis.

6. In cases of paralysis in young women do not be misled by the condition called hysteria.

7. In a case of enlarged glands of the neck in a middle-aged patient examine the back of the mouth and pharynx for a small epithelioma.

8. Early lobar pneumonia may closely simulate appendicitis.

9. If a man complains of pain and you cannot find anything wrong, always treat his statements with the greatest consideration. G. W. HOCHREIN.

Adler, I., and Sittenfield, M. J.: Preliminary Note on the Possible Effects of the Nervous System on Growth and Development of Tumors. *J. Cancer Research*, 1917, ii, 239.

The methods available for determining the effect of the nervous system on tumors are:

1. Histologic — to determine the relation of the nervous system to tumors, and if tumors have no nerves in their substance determine the biologic conditions causing this.

2. Inoculate transplantable tumors into organs with nerves severed and with nerves intact and see if there be any difference in growth.

The authors used Flexner-Jobling carcinoma for inoculation into rats' testicles. Of 14 rats with testicles denervated all developed tumors exceptionally large after inoculation. Of 20 rats with testicles with intact nerves, none showed signs of tumor after inoculation. MAX KAHN.

Adamson, R. S., and Cutler, D. W.: Note on a Bacillus Resembling *Bacillus Tetani*. *Lancet*, Lond., 1917, cxcii, 688.

The authors have noted an anaerobic bacillus closely resembling in appearance the bacillus tetani nine times in films from septic and gangrenous wounds and have four times isolated them, once in blood culture after the death of the patient. Two of the patients from whom the bacillus was isolated developed tetanus. The authors regard the bacillus as a member of the large group of intestinal anaerobic bacteria which include not only bacillus tetani, bacillus oedematis maligni, and bacillus aerogenes capsulatus, but also probably a large group of other as yet undifferentiated varieties.

The microscopic and cultural characteristics seem to differ in important respects from the already described members of the group. All four strains isolated fail to produce toxin, and the cultural characteristics on the media used differ in essential details from those of bacillus tetani. Injections of pure cultures failed to produce any effect on guinea pigs.

It is obvious that the occurrence of this bacillus in septic wounds adds considerably to the difficulty of diagnosis of tetanus by purely microscopic methods. C. A. HEDBLUM.

Sollmann, T.: Convenient Devices for Melting Paraffin for Burns. *J. Am. M. Ass.*, 1917, lxxviii, 1895.

The author has experimented with two devices which are simple and appear practical: an electrical

"food warmer" for office use; and an "acetate thermostat" for shop and field practice.

1. The food warmer was the pint size sold in the stores for warming babies' milk bottles. When filled one-half or two-thirds with paraffin of melting point, 47.5°C ., it can be used in three minutes after the current is turned on. If the current is then turned off for two minutes, it will have just the right temperature. It will remain sufficiently melted for ten minutes without current, when a crust begins to form; it can then be again made usable by turning on the current for a few moments.

2. The acetate thermostat, which appears especially practical, consists of an ordinary glue pot of size o. The outer pot is filled two-thirds with official sodium acetate — probably something over a pound being required. The inner vessel holds about a pound of paraffin. When sodium acetate is used to fill a pot surrounding a vessel containing paraffin, it keeps the paraffin melted at just the right temperature for application for three hours after the pot has been removed from the fire. If, in the meantime, it has been set into a fireless cooker, the time can be further prolonged.

EDWARD L. CORNELL.

Sargent, E.: The White Adrenal Line; Its Production and Diagnostic Significance. *Med. Press & Circ.*, 1917, ciii, 599.

Sargent describes the technique of his white adrenal line as follows: Before making the test place the patient at rest for at least 15 minutes with the abdomen free and but slightly covered. The skin of the abdomen is selected by preference and on it is traced a geometrical figure. Ordinarily he outlines a square around the umbilicus with a blunt object, taking special care to avoid rubbing or scratching. The figure should be made by a simple superficial stroking, deliberate and never rapid. Immediately following the outlining nothing is seen. In about one-half minute a pale line or band begins to be noticed, which slowly increases and essentially exceeds in size the actual area touched by the finger tip. This line remains two or three minutes.

This is what is to be expected in well-defined cases of adrenal insufficiency; the only ones, in fact, in which the test has any real value. The lighting plays an important part. It is sometimes difficult to see the white light in bright daylight or sunlight, or even in bright electric light. It is his custom to draw up a sheet or the clothing in such a way as to produce a light shadow.

He explains the white line as follows: In arterial hypotension there is a peripheral vasodilatation; if we begin to produce a light stimulation of the skin vasoconstriction will replace the vasodilatation.

He does not attempt to state that the finding of the white adrenal line is sufficient ground upon which to base a diagnosis, but states that it stimulates one to look for other symptoms which may

prove the presence of a certain disease. He warns the profession against the somewhat growing tendency to seek the absolute in clinical medicine.

G. W. HOCHREIN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Stewart, G. N., and Rogoff, J. M.: The Influence of Asphyxia upon the Rate of Liberation of Epinephrin from the Adrenals. *J. Pharmacol. & Exp. Therap.*, 1917, x, 49.

The hyperglycemia and glycosuria associated with asphyxia, as the authors state, have been explained by some writers as due to stimulation of the adrenals to increased liberation of epinephrin. This, however, they say, is a hypothesis unsupported by any conclusive evidence showing that in asphyxia the rate at which epinephrin is discharged is, as a matter of fact, increased. Since it has been proved that the liberation of epinephrin from the adrenals is under the control of nerves, it would seem to the authors probable that asphyxia, which causes excitation of so many nervous centers, might excite the central mechanism on which the epinephrin secretion depends. They endeavored to put the question to the test by collecting adrenal blood in a vena cava pocket, and then by releasing the pocket permitting it to elicit the reactions appropriate to epinephrin on the blood-pressure. In cases in which the pupil was not too greatly dilated by the asphyxia the (denervated) eye reactions, after excision of the superior cervical ganglion according to the procedure of Meltzer, were also employed. The results were negative. No clear difference could be made out in the magnitude of the reactions, in cats, when adrenal blood was collected in the pocket for equal times with and without asphyxia. As the epinephrin is, of course, greatly diluted before it reaches the sensitive structures concerned in the blood-pressure and eye reactions, they repeated the observations with unmixed adrenal blood withdrawn from the cava pocket by a cannula and tested upon rabbit intestine and uterus segments according to the method formerly introduced by one of the authors. Specimens of adrenal blood were collected for accurately measured periods of time, with free and with obstructed respiration. Since when the adrenal blood flow is diminishing in successive samples, the concentration of epinephrin goes on increasing, the asphyxial and non-asphyxial periods did not follow each other in any definite order, so that an increase of concentration due merely to the diminution in the blood flow might not simulate an increase due to asphyxia. Special weight was also given to observations in which the successive samples, with and without asphyxia, were collected with unchanged rate of blood flow.

An attempt was made by the authors to determine whether asphyxia produces a detectable increase in the rate of liberation of epinephrin from

the adrenals, as determined by testing adrenal vein blood on rabbit intestine and uterus segments, and the result was negative. GEORGE E. BEILBY.

Stewart, G. N., and Rogoff, J. M.: Quantitative Experiments on the Liberation of Epinephrin from the Adrenals After Section of Their Nerves, with Reference to the Question of the Indispensability of Epinephrin for the Organism. *J. Pharmacol. & Exp. Therap.*, 1917, x, 1.

It is known that after section of certain nerves the rate of the spontaneous liberation of epinephrin is greatly reduced. This, the authors state, may be very easily demonstrated in the cat in acute experiments by the method previously described by them—collection of adrenal vein blood in a cava pocket, and the action of the blood when released in eliciting dilatation of the pupil and retraction of the nictitating membrane in the eye previously prepared by Meltzer's procedure, so as to react with great sensitiveness to epinephrin. After section of the fibers coming to the semilunar ganglion, including the splanchnics, or after section of the two sympathetic trunks, including the splanchnics, in the thorax near to the diaphragm, the eye reactions, the authors claim, are in general no longer obtained, unless with considerably longer periods of collection of blood than were sufficient to elicit them strongly before the nerve-section. The rise of blood-pressure associated with the release of blood containing epinephrin is likewise missing, they state, after the nerves have been severed. In survival experiments also they found that when the right adrenal was excised and the fibers coming to the left semilunar ganglion cut the eye and blood-pressure reactions could no longer be detected.

Since cats survived this operation indefinitely, and so far as can be seen after recovering from the operation in the same health and vigor as normal animals, the authors believe the experiments obviously have a bearing on the question whether epinephrin is indispensable to the organism. They therefore undertook to determine the magnitude of the residual liberation of epinephrin, if any, from the denervated gland.

Experiments were carried out in ten normal cats taken at random from the stock, and the results given in detail in a series of tables. From an extensive study the authors append the following summary:

As shown in a previous paper, by the blood-pressure and eye reactions, after section of the nerve supply of the adrenals no demonstrable liberation of epinephrin was present in cats as long as five weeks after the nerve-section.

As it was easier to detect very small concentrations of epinephrin by the rabbit intestine and uterus segments, they made a series of survival experiments in cats in which these tests were used to supplement the eye reactions. In all the animals

one adrenal was excised and the nerves of the other cut.

In a cat tested two weeks after the operation, it was shown that the adrenal blood serum could not have contained 1:300,000,000, or the blood 1:400,000,000 of epinephrin; and that the rate of liberation of epinephrin could not have been at most 0.000001 mg. per minute for one adrenal. In another cat three weeks after the operation the serum of the adrenal blood was proved to contain less than 1:400,000,000 and the blood less than 1:700,000,000 epinephrin. The output of epinephrin per minute could not have been as much as 0.000009 mg. per minute, for one adrenal. The segments used for the tests in these experiments were extremely sensitive, and the limits of adrenalin concentrations which could be detected with certainty were carefully determined. The eye reactions were negative. In these two cats the rate of liberation of epinephrin, if any liberation whatever was going on, must have been several hundred times less than the rate in normal animals under the same experimental conditions, the authors state.

They believe it scarcely necessary to point out that experiments yielding completely negative results indicating the absence of epinephrin with very sensitive test objects are much more important for the questions studied than experiments in which small amounts of epinephrin can still be detected, for it is impossible, they state, to be certain that when a little epinephrin is found some of the fibers concerned in the liberation may not have escaped section.

Since these animals completely recovered from the operation and behaved in every way like normal animals, they concluded that the liberation of epinephrin from the adrenals is not indispensable for life or health, unless the necessary quantity is, even in the adrenal vein blood, below the limits of detection by the methods used. The epinephrin in the adrenal blood was diluted enormously (probably at least one hundred times) in the right heart; so that in these cats the concentration in the arterial blood could not, at most have reached 1:40,000,000,000 and 1:70,000,000,000 respectively.

If the liberation of epinephrin is totally abolished by division, in the dorsal cord, of the path concerned in it, as the authors' experiments on the relation of the spinal cord to the spontaneous liberation of epinephrin indicated, this, they believe, corroborates the conclusion that epinephrin is not indispensable, since numerous animals and men have long survived such lesions. Their experiments indicated that the entire liberation of epinephrin from the adrenals is controlled by nerves.

In some of the other cats the residual output of epinephrin was so small that it was doubtful whether it was being liberated at all in detectable amount. In all, the rate of liberation, even where a definite output could still be detected, was reduced to a small fraction of the normal.

In a number of acute experiments on cats and

dogs, the reduction in the output of epinephrin after section of the various possible nerve paths to the adrenals was studied. In all, epinephrin was still found in detectable amount in the blood coming from the adrenals, although the rate of liberation was reduced to a small fraction of the initial amount.

GEORGE E. BEILBY.

Slye, M.: The Inheritance Behavior of the Infections Common to Mice; Studies in the Incidence and Inheritability of Spontaneous Tumors in Mice. *J. Cancer Research*, 1917, ii, 213.

The conclusions reached are as follows:

1. In every case where a cancerous individual is bred in — either in inbreeding or hybridization — cancer comes out in great percentage in the resulting strain.

2. Cancer tendency and non-tendency segregates out conspicuously as inheritable characters, while there is no such segregation of any infection tendency.

3. From matings of mice, one parent cancerous, it is possible to extract lines which follow Mendelian strains.

4. From matings of mice, one parent dying with common infection, it is impossible to derive anything which approximates Mendelian strains.

5. There is no similarity whatsoever between inheritance behavior of cancer and inheritance of common infections.

MAX KAHN.

Sittenfeld, M. J.: The Significance of the Lymphocyte in Immunity in Cancer. *J. Cancer Research*, 1917, ii, 151.

The high degree of lymphocytosis caused either by subcutaneous injections of pilocarpine or intravenous injection of leucocyte cream from rats which had received stimulating doses of X-ray affords neither protective nor defensive mechanism against tumor inoculation. Neither increase nor reduction in lymphoid elements of the blood have any influence on the resistance or the susceptibility to tumor growth.

MAX KAHN.

RADIOLOGY

Pfahler, G. E.: X-Ray Diagnosis in Diseases of the Chest. *N. Y. M. J.*, 1917, cvi, 53.

The X-ray is valuable in the diagnosis of any condition which produces (1) any change in the contour of the chest; (2) any change in density in the chest itself or any of its organs; (3) any change in the movements of the organs in the chest. The value of the examination depends not only upon the ability to produce good plates or fluoroscopic images but also upon the ability to interpret the findings. Skill in interpretation increases proportionately with the roentgenologist's knowledge of the macroscopic changes produced in the organs of the chest by disease and also upon his

knowledge of the history, location, and progress of such disease. The roentgen signs should always be considered in conjunction with the clinical findings.

Pulmonary tuberculosis can be recognized as early as there are tissue changes causing variations in the density of the lung. Early changes can be seen only on stereoscopic plates. These changes consist in the minute deposit of tubercles, most often at the apices, and particularly extending downward along the vertebral border. They may also occur at the apex of the lower lobe or the outer border of the middle lobe. In children the earliest changes are found extending outward from the roots of the lungs. The extension of disease downward from the apices toward the base should always suggest tuberculosis. The peribronchial infiltration so often seen around the lower lobe bronchi is rarely tuberculous but is commonly found in chronic bronchitis. The conditions hardest to differentiate from tuberculosis are metastatic carcinoma, leukæmia, and syphilis of the lungs. In metastatic carcinoma there is usually a previous history of carcinoma. The infiltration usually spreads outward from the roots of the lungs, but not necessarily so. In carcinoma the disease spreads by direct extension into surrounding tissue thus giving a more uniform appearance than in tuberculosis. There is seldom, if ever, cavity formation, and there is usually more pain.

Leukæmia presents a general mottling similar to tuberculosis and usually involves the entire lungs. The differentiation must be made clinically.

In syphilis the involvement is more apt to be general or to extend outward from the roots of the lungs, while in tuberculosis the disease begins at the apices and extends downward.

In bronchiectasis, if the cavities are large and numerous the differentiation is easy. The condition is found most often at the base of the lungs although it may also involve the upper bronchi.

Bronchopneumonia cannot always be differentiated, especially in children. This disease usually extends outward from the roots of the lungs. If tuberculous the extension is apt to be upward, if from other infection, outward or downward.

In lobar pneumonia there is usually consolidation of one or more lobes, although the consolidation may not be complete. It sometimes takes weeks or months for the lungs to clear up after lobar pneumonia.

Tumors of the lungs are practically always secondary and a history of tumor elsewhere can usually be obtained. The author has seen one case of primary carcinoma of the lung which disappeared under X-ray treatment.

Metastatic sarcoma gives sharply defined nodules scattered throughout the lungs. Pulmonary symptoms may be slight. It differs from carcinoma in that the areas are more discrete with clear borders, while in carcinoma the infiltration is more general and fuzzy in appearance at the edges.

Acute pleurisy can be diagnosed only when it limits the motion of the chest or diaphragm.

Chronic pleurisy with adhesions, if attached to the diaphragm, will limit its motion at the point of attachment. If the pleura is greatly thickened a decrease in transparency results. Pleuritic effusions must be looked for with the patient upright as they will not be found otherwise if the amount of fluid is small. The upper level of the fluid is curved and not level and forms a sharp line of demarcation with the lung.

Encysted pleural effusion gives a characteristic appearance. There is a circumscribed dense area, surrounded by clear lung tissue, the border being sharply defined, in this respect differing from abscess of the lung. In abscess in the early stage the appearance is simply one of localized consolidation gradually shading off into surrounding tissue. After necrosis and evacuation of pus, a cavity is formed, surrounded by an area of consolidation. The pyogenic cavity usually is found at the middle or base of the lung, the tubercular cavity at the apex.

Gangrene of the lung gives the same X-ray appearance as abscess of the lung.

The size, position, shape, and character of pulsation of the heart are observed. No definite standard of size can be set and each case must be considered individually. The size of the heart can be accurately determined by making plates at a distance of six feet, a procedure known as teleoroentgenography. The position of the heart is also variable. When the diaphragm is high the heart lies transversely. If the chest is long and the diaphragm low the heart is vertical. Changes in the shape of the heart have great diagnostic value. In hypertrophy of the left ventricle the heart projects to the left. In general dilatation the heart changes from pear shape to a globular form. A study of the heart pulsation on the fluoroscopic screen often gives valuable evidence as to the progress of a heart lesion and the probable prognosis.

In pericardial effusion the heart shadow is changed to a triangle with the base at the bottom, and pulsations are obscured or blotted out. The great vessels can be studied and aneurism or atheroma with calcification may be easily recognized.

Mediastinal tumors are differentiated from aneurism by absence of expansile pulsation and if multiple, such as enlarged glands, the shape will be characteristic. Malignant tumors have a tendency to extend outward into the lungs.

The conclusions are: (1) The roentgen rays are valuable in diagnosing any change in density of the lung tissue. (2) They are useful in recognizing position, fixation, or deformities of the diaphragm. (3) Any condition modifying the size, position, outline, or pulsation of the heart will be detected. (4) Aneurism and other mediastinal tumors will be recognized and usually accurately differentiated.

G. W. GRIER.

Young, J. S.: Simple Method of Localization of Foreign Bodies. *Arch. Radiol. & Electrotherap.*, 1917, xxii, 40.

The method employed by the author, as described by himself, consists simply in the use of a small apparatus, with an aluminum base, which rests underneath the part which contains the foreign body, and an upright standard which rests upon the broad end of the aluminum base. This standard has two adjustable cuffs — an upper and a lower — through each of which a rod passes. The upper rod has a loop on its end, while the lower has a small metallic ball. These rods are both adjustable in two directions, and are secured by two set-screws.

The patient is placed upon the aluminum base (tube of course underneath table), the foreign body is located by the central rays, and the loop is pressed directly over the same. After having pressed the loop on the upper rod close to the skin so that there will be no motion, the diaphragm is then opened and the tube moved up and down and the ball then adjusted so that it moves in the same plane with the foreign body. The foreign body is thus located in two directions, the ball locating it at the base line, and the loop locating it in the perpendicular plane.

The method is perfectly simple and is absolutely correct, if the operator is careful first in posing his patient, and second in observing that the foreign body and ball move in the same plane. Otherwise he will find there is a variation of from half an inch to two inches in the lower plane of his localization.

A. HARTUNG.

Wilkins, W. A.: The Localization of Foreign Bodies. *Am. J. Roentgenol.*, 1917, iv, 343.

The author dismisses the two-plane and stereoscopic methods of localization by brief mention as having only a small field of usefulness. The method of choice which he has found entirely efficient under conditions of active service is a modification of a method described by Hampson some years ago depending upon a triangulation calculation. Two exposures are made upon the same plate with the foreign body as nearly as possible perpendicularly above the center of the plate. During the first exposure the center of the target is a known distance vertically above the center of the plate. This center is indicated by crosswires stretched on an overlying board and these when inked leave their impress on the overlying skin. The second exposure is made with the tube shifted a known distance horizontally in the direction of either cross-wire. To ascertain the location of the foreign body in relation to the center of the cross-wire, direct measurement is made after the true position of that body has been obtained by certain intersecting lines. The depth of the foreign body is found by constructing right-angled triangles whose bases are represented respectively by the distances between the foreign body shadows and the shift of the

target. The perpendiculars can be ascertained algebraically as the total is a known quantity — being the distance from the target to the plate. With the ink-marks of the cross-wires as guides, a final mark is made on the skin to represent the spot beneath which the foreign body lies at the determined depth.

A number of cases to demonstrate the method are illustrated and described. The author recommends it for its simplicity and practicability, having tried it under many and varied circumstances to the satisfaction of all concerned. A. HARTUNG.

Skinner, E. H.: The Sutton Method of Foreign Body Localization. *Am. J. Roentgenol.*, 1917, iv, 350.

The method is best described in the originator's own words quoted from Binnie's "Operative Surgery":

"Having located the shadow of the foreign body by means of the axial ray upon a large screen, firmly supported about six inches above the surface of the part examined, the surface is painted with iodine, cocainized, and a small skin incision made in the center of the shadow. The special cannula bearing the blunt or sharp trocar, as circumstances may indicate, and held by a strong clamp at right angles, is then entered through the skin incision. The room is then darkened and under the guidance of the X-ray the instrument is driven through the tissues. As long as the point is advancing straight toward the anode, and hence toward the foreign body, the shadow of the point will be hidden by the shadow of the upper portion of the instrument.

"When the trocar strikes the foreign body, the patient invariably complains of a sharp pain. Contact is then verified by slight waving movements of the point of the trocar which can be made to cause the foreign body shadow to describe a circular excursion on the screen.

"The current is now cut off, the screen removed, and the room lighted while the operator continues to hold the trocar immovable. Next the trocar is withdrawn from the cannula and one of the small hooked piano-wire indicators inserted in its place. Holding the hook of the latter against the foreign body, the cannula is withdrawn and the wire snipped off one-fourth inch above the skin. Over this a fairly thick dressing is applied. If other foreign bodies are present, each may be localized in the same way. On the operating table each indicator may be readily followed to the corresponding foreign body. The particular advantages of this method are:

"1. Operations may almost always be done under local anæsthesia.

"2. Changes in the position of limbs or body do not vitiate the result.

"3. There are no calculations to introduce a possible mathematical error.

"4. The localization may be carried out aseptically without sterilizing the hands."

This method has simplicity, ease and rapidity of application, and absolute accuracy to recommend it and practically none of the sources of error or difficulties of application incurred with the various triangulation or other methods in use.

A. HARTUNG.

Simpson, F. E.: Radium Therapy with Special Reference to Its Use in Dermatology. *Radium Quarterly*, 1917, i, 1.

Radium applied therapeutically produces a selective or inflammatory reaction depending upon the dosage used. In the former case abnormal tissues may undergo retrograde metamorphosis without visible inflammatory changes; in the latter, changes varying from simple erythema to deep ulceration may occur. These reactions always subside or heal sooner or later, according to the author's experience, and unless the destruction produced has been too extensive owing to over-dosage the radium scar is almost always smooth, elastic, supple, and free from defects inherent in almost every other kind of destructive agent.

The types of dermatoses mentioned as being favorably influenced by radium are:

1. Those in which it is desirable to remove the hair, e.g., hypertrichosis, sycosis, and ringworm of the scalp.

2. Those in which it is desired to diminish the size or function of the sebaceous or sweat glands, e.g., acne rosacea.

3. Those due to various bacteria, e.g., lupus vulgaris.

4. Those characterized by an inflammatory indurated condition of the skin in which it is desired to stimulate the metabolism of the tissues, e.g., lichen planus and lupus erythematosus.

5. Those characterized by infiltration of malignant cells, such as carcinoma and sarcoma, or by cells of low vitality as in leukæmia.

6. Those characterized by angiomatous or lymphangiomatous tumors.

7. Those in which epithelial hypertrophy or hyperplasia is a prominent feature, e.g., warts and linear nævus.

8. Those in which it is important to relieve a localized itching, e.g., eczema and lichen chronicus simplex.

ADOLPH HARTUNG.

Hanford, C. W.: Some Experiences with Radium. *Illinois M. J.*, 1917, xxxi, 389.

The author discusses, in a rather informal way, the physical properties of radium and the physiologic action of the various rays. A number of pathologic conditions are mentioned as having been benefited by radium treatment, but the exact method of application has not been given, and there is no tabulation of results, the author merely reporting either cure or improvement.

Considerable emphasis is laid on the use of radium in deep conditions, such as malignancy of the pelvic structures and also myomata. He seems to be

enthusiastic over the results of the use of radium in carcinoma of the bladder and rectum.

The advantages of radiation following surgical removal of cancer mass, both in the breast and pelvis, is also dwelt upon.

In conclusion, he mentions the necessity of considering every case as a separate problem, i.e., no set rules can be laid down for the treatment of similar conditions in different individuals. The necessity for surgical cleanliness is dwelt upon. He does not feel that radium will ever replace surgery in malignancy, but considers that radium treatment will serve where formerly the knife was brought into requisition with no hope of ultimate success, but merely as a last resort.

W. A. EVANS.

Finzi, N. S.: Skin Ink. *Arch. Radiol. & Electrotherap.*, 1917, xxii, 38.

To meet the needs of a skin localization mark which was indelible and proof against rough treatment, the author made a number of experiments which resulted in the following formula:

Acid pyrogallol.....	1 gram.
Acetone.....	10 ccm.
Liquor ferri perchlor. fort.....	2 ccm.
Sp. vini meth. ad.....	20 ccm.

This solution meets all the requirements demanded of such a substance:

1. It stains the skin such a color that it will show up against iodine.
2. The mark is unaffected when rubbed with spirit, acetone, ether, soap, or tincture of iodine.
3. The mark lasts when covered up with dressings, at least five days, and longer.
4. The mark is quickly and easily made, and does not hurt the patient when placed on a part that is acutely inflamed and tender.
5. The substance used for the mark does not damage or inflame the skin.
6. It is possible to see the mark immediately it is made.
7. The materials used are easily obtainable.

The solution is best kept in a bottle with a camel's hair brush attached to the cork so that it can be easily painted on. The mark is brownish grey at first but after a few hours turns a brilliant black.

A. HARTUNG.

MILITARY SURGERY

Hounsfield, M.: Recovery After Thrombosis of the Superior Vena Cava. *Lancet*, Lond., 1917, xciii, 87.

The case is reported of a nurse of 42, taken suddenly ill with vomiting while on night duty. The patient noted that her face was very blue. She had remained on duty for three nights, and was then in bed for three weeks. At this time, her face was cyanosed and all the superficial veins of the head, neck, and upper chest were dilated and these

parts were much swollen. Clinical and radiosopic examination was essentially negative, except for a localized musical precordial murmur. Because of exclusion of any cause for external pressure on the superior vena cava, it is concluded that the obstruction was internal and probably a thrombosis.

C. A. HEDBLUM.

Tavernier, L.: Early Secondary Reunion of War Wounds (*La reunion secondaire precoce des plaies de guerre*). *Lyon chir.*, 1917, xiv, 1.

Tavernier says that Carrel's work has drawn much more attention to the employment of Dakin's solution than to the secondary reunion of wounds by suture. His study of Carrel's method has given him the impression that the thing of importance is the complete cleansing of the wound, and that those wounds afterward treated by irrigation with hypochlorite solution evolved sensibly in the same way as those which had been subjected to mechanical cleansing.

The only advantage which he has found in the use of Dakin's solution in such cases is to hasten the elimination of contused and secondarily necrotic tissue. But it is simpler to resect such tissue primarily. He has therefore abandoned irrigation, but he adheres to Carrel's method of systematic secondary reunion which very much shortens the recovery period. While Carrel is not the originator of this to him belongs the credit of bringing it into general use.

Tavernier's report deals with the early secondary suture of 79 wounds. His technique after the X-ray examination consists in a wide incision; clearance of all missiles and other foreign bodies, counter-incision on the lowest point for drainage, excision of all injured soft parts, skin, muscles, and especially aponeurosis.

If there is a fracture all bone spiculæ must be removed whether adherent or not. If this is not done a chronic osteitis may result which is more annoying than delayed consolidation of an aseptic fracture; careful hæmostasis and suture of divided nerves when required. In general the temperature falls in from two to three days. After one day or so of pyrexia, in the case of wounds of the soft parts, and several days in cases of fracture, the wound is sutured if the general appearance is satisfactory. A slight secretion or a layer of fibrin without pus does not compromise the good results.

Tavernier's 79 cases gave 67 successes, 2 unsuccessful cases, 7 incomplete successes with partial disunion and 3 complications — 1 hæmorrhage, 1 empyema, 1 septic arthritis. The 3 complications recovered after suitable treatment.

W. A. BRENNAN.

Nogier, T.: Solidified Alcohol and Its Use in War Surgery (*L'alcool solidifié et ses usages en chirurgie de guerre*). *Presse méd.*, 1917, p. 426.

Nogier gives the following reasons for the use of solidified alcohol in war surgery:

1. Because it permits one to obtain rapidly the degree of heat necessary to sterilize water and surgical instruments.

2. Because it permits rapid cleansing and sterilization of the surgeon's hands.

3. Because being at the same time a soap and a product rich in alcohol, it cleanses instruments admirably after an operation.

4. Because it is one of the best means of cleansing the skin in the operative field. It is neither irritant nor caustic.

The author describes his method of preparing solidified alcohol.

W. A. BRENNAN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Murray, G. D.: Mine Injuries to the Eye as Related to the Compensation Law. *Penn. M. J.*, 1917, xx, 695.

Murray gives the results of a six months' study of the application of the Compensation Law at the Lackawanna Coal Co. All injuries were treated at the Moses Taylor Hospital. These included 102 cases, ranging from a foreign body in the eye to serious injuries, one case requiring enucleation. Murray emphasizes the importance to patient and employer of immediate professional care of every injury, no matter how slight.

The patients who reported promptly for treatment had an average disability of six and one-half days with complete recovery. In the series, 18 men did not apply for treatment until from five to ten days after injury; of these, 13 had an average disability of 31 days with resulting foul ulcers of the eyes and impairment of vision for life.

According to the law the injured miner receives medical attention only for the first two weeks; and thereafter compensation equivalent to half his earning power, not exceeding 125 weeks. It is optional on the part of the employer to provide medical treatment after two weeks. This seems to be inadequate. An employee must be totally blind in one eye before he is entitled to a full com-

pensation of \$725.00. The remedy offered is that an employee when injured should be compelled to seek immediately the best treatment or forfeit his compensation. The employer should indemnify the employee not only for complete loss of vision, but partial loss as well, if the latter lives up to the contract.

All cases are reported in detail. They are classified as: foreign bodies, 26; traumatic conjunctivitis and contusions, 44; burns 3; ulcers, 14; lacerations, 13; abrasions 2.

L. R. GOLDSMITH.

McCarrison, R.: India and Medical Progress. *Brit. M. J.*, 1917, ii, 109.

Western medicine in India has always been represented by the merest handful of medical men, most of them belonging to the Indian Medical Service. At the present time they number about a thousand men. Yet the contributions of these few men to our knowledge, particularly of tropical medicine, have been of the first importance.

Chief among these contributions was the discovery by Ross that the plasmodium of malaria is conveyed to man by the anopheles mosquito. This achievement was epoch making and laid the foundation for the science of tropical medicine. Donovan of the Indian Medical Service demonstrated for the first time the causal agent of kala azar. Vandyke Carter worked out the origin and development of relapsing or spirillum fever and Mackie discovered that pediculus vestimenti was its carrier. Liston and Bannerman discovered the rôle played by the rat and the rat flea in the propagation and spread of plague and Haffkine worked out a method of protective inoculation. The hypertonic saline treatment of cholera devised by Leonard Rogers reduced the mortality of that dread disease from 70 to 23 per cent and his treatment of amœbic dysentery with emetine hydrochloride is a specific. Notable contributions have also been made to the treatment of other forms of disease. Indian surgeons have performed an enormous amount of work and have led the world in the practice of litholapaxy, ophthalmology, and rhinoplasty. C. A. HEDBLÖM.

GYNECOLOGY

UTERUS

Dickinson, R. L.: Cancer of the Cervix; Cautery Amputation. *Am. J. Obst.*, N. Y., 1917, lxxv, 737.

The author gives a clear description of the technique employed in the cautery amputation for cancer of the cervix, and gives the following summary: Cervical cancer that is curable, is curable by partial cautery hysterectomy as often as by grave operations, and is attended with very low mortality and morbidity. These with the absence of shock, a lessened fear and readier consent, encourage new trial of the somewhat expanded Byrne operation. Removal of paravesical and paracervical tissues, together with the entire uterine canal, leaving only the fundus to peritonealize the operation, done with the electrically heated heavy platinum knife, with the finger in the rectum, or thermometer in the bladder, and sometimes with the hand in the abdomen, permit more extensive work than formerly, and promise better results.

C. H. DAVIS.

Lahille, A.: The Quantity of Blood Lost During Menstruation (De la quantité de sang que les femmes perdent au cours des règles). *Ann. de gynéc. et d'obst.*, 1917, lxxii, 535.

From a number of observations Lahille concludes that the figures cited by different authors (from 100 to 500 grams) to express the quantity of blood lost during menstruation are grossly exaggerated.

From the observations of a number of women on whom his research was made Lahille finds: (1) that one-fourth lose a quantity not exceeding 20 grams; (2) about one-half lose a quantity of about 50 to 55 grams; (3) one-fourth lose up to 65 grams.

When the quantity of blood lost exceeds 80 grams the menstruation is exceptional in character. It may be considered menorrhagic, this menorrhagia being the result of the duration as well as the intensity of the flow. Generally there are disturbances, and it is probable that in such cases there is a predisposition to some morbid affection.

During the time of maximum intensity of so-called abundant menses the flow of blood appears to be from 15 to 20 grams per day. Thus women of the first group whose period lasts from four to five days, with maximum intensity the second or third day, lose five grams the first day, 30 to 40 grams the second and third days, 5 to 10 grams the fourth and fifth days. But the quantity, 15 to 20 grams per day, may be exceeded in exceptional cases.

The weight of the dry extract of the menstrual product serves not only to indicate the quantity

of sulphuric acid which must be added in order to destroy organic matter, but also to evaluate the substances foreign to the hæmoglobin and to the blood—serosities, mucosities, etc. It is not exaggerating to admit that 100 grams of a woman's blood contain from 21 to 22 grams of dry residue. The difference between the weight of the dry extract found and the calculated theoretic weight of the dry extract represents the weight of the dry extract of these foreign matters alluded to.

W. A. BRENNAN.

Esquerdo, D. A.: Uterine Retroflexion; Its Consequences and Treatment (La rétroflexion utérina—sus consecuencias y tratamiento). *Therapia*, Barcelona, 1917, ix, 390.

Esquerdo says that while retroflexion of the uterus does not always cause pain or inconvenience it should nevertheless be carefully supervised. There are many uterine retroflexions unrecognized because they are accompanied by adnexal lesions and these dominate them. When the retroflexion is accompanied by adnexal lesions the treatment should not only remove the disturbances but prevent their recurrence. When there are neither adnexal lesions nor adhesions a pessary and medical treatment is sufficient; but when the persistence of symptoms calls for a radical treatment, vaginal and extra-abdominal operations will not solve the difficulty or relieve the patient. Ligamentopexy is the safest and most radical operation. It gives the uterus more freedom, and if there are important adnexal lesions or lesions of the uterus, it allows the extirpation of these organs. W. A. BRENNAN.

Jayle, F.: American Surgeons and Abdominal Hysterectomy for Cancer (Les chirurgiens Américains et l'hystérectomie abdominale pour cancer). *Presse méd.*, 1917, p. 420.

Jayle claims that abdominal hysterectomy is not German in origin. Ries of Chicago proposed the radical operation including ablation of the ligaments and iliac ganglia in March, 1895, at the German Congress of Frankfurt. The radical operation was carried out by Clark and in conjunction with Kelly he reported 8 cases so operated in 1896. Wertheim did not make his first radical operation till 1898, following the suggestion of Ries. He is not mentioned in Cullen's book on uterine cancer.

To Ries also belongs the credit of originating the circular vaginal incision for facilitating uterine extirpation which he also suggested in 1895.

Jayle says that there is no Wertheim operation any more than there is a Trendelenburg position (already fully described in the 13th and 17th

centuries); nor Hirschsprungs disease (described by Ruysch in the 17th century). If operations must bear personal names then the so-called Wertheim operation should be called Clark's operation.

W. A. BRENNAN.

Tracy, S. E.: The Disposition of the Ligaments in Hysterectomy. *Penn. M. J.*, 1917, xx, 461.

The author describes the technique of disposing of the round and infundibulopelvic ligaments after hysterectomy — supravaginal or complete. Briefly it is as follows: The infundibulopelvic and round ligaments of either side are tied off in one pedicle. The uterine arteries are tied in the usual manner. Amputation of the uterus is carried out in the usual way and the cervical canal cauterized. The anterior and posterior lips of the cervix are approximated, the first suture on either side encircling the corresponding uterine artery. Having completed the closure of the cervix, the ligated pedicle on either side containing both the round and infundibulopelvic ligaments, is sutured to the uppermost part of the cervical stump, care being taken to place the anchoring suture distal to the ligature. This point the author emphasizes because if the suture is placed proximal to the ligature, there is danger of slipping the ligature, with consequent hæmorrhage. All raw surfaces are then peritonealized in the usual way.

This procedure is applicable also to complete hysterectomy by simply anchoring the ligaments of either side into the summit of the closed vaginal canal.

In any case, proper restoration of the pelvic floor should precede the abdominal operation.

The author has never seen prolapse occur after hysterectomy done by this method.

HARVEY B. MATTHEWS.

ADNEXAL AND PERIUTERINE CONDITIONS

Oui, H.: Vesicular Mole and Ovarian Cyst (Mole vesiculaire et kyste des ovaires). *Ann. de gynéc. et d'obst.*, 1917, lxxii, 566.

The patient, a woman 27 years old, a V-para with two abortions, entered the clinic with a history of the last menses three months before, abundant hæmorrhages and abdominal pains. The uterus was found enlarged, and a large mass of vesicles with clots was found in the vagina and also filling the uterus. These were principally adherent to the anterior face and the left cornua. They were easily detached and removed and the uterus curetted. The condition of the patient remained quiescent for about a month but small discharges of blood continued. A mass having the form of the uterus persisted in the hypogastric region. Manual palpation showed this mass to be mobile, giving the impression of a thickened wall in its anterior part. The vaginal cul-de-sacs were quite free.

Thinking that the mole had penetrated the uterine wall the author decided on a hysterectomy which showed that both adnexæ were diseased; the

right showed a suppurated salpingitis and a multilocular cyst of the ovary; on the left there were similar lesions less marked. The mass formed by the uterus, the inflamed tubes, the cysts, and omental adhesions was so regular and showed the form of the non-involved uterus so clearly that this diagnosis could be made. The cysts were of the mucoid type; there were no traces of lutein cells.

W. A. BRENNAN.

Federici, N.: Severe Hysteria Cured by Bilateral Ovariectomy (Forma grave d'isterismo guarito con la ovariectomia bilaterale). *Riforma med.*, 1917, xxxiii, 519.

A married woman of 39 years, nullipara, showed genuine hysteria of long standing. By careful examination the author was able to exclude other organs and concluded that the genital apparatus was connected with the neurosis. The uterus appeared infantile, the menses were scanty, and the sterility in the case led him to this opinion. An exploratory laparotomy verified the infantile uterus and both ovaries were abnormally small and appeared to be in a condition of fibrosclerotic involution. Both were removed. The postoperative course was regular. After recovery the various hysterical phenomena which the woman had previously presented disappeared gradually and the woman was restored to excellent health.

The author has no doubt that the result in this case was due to the operative act and not to suggestion which he had previously tried without the least result. He thinks that the greater part of the major neuroses are exponents of some anatomic or physicochemical alterations which are latent and unrecognized.

W. A. BRENNAN.

Bello, E., and Castanedo, M.: A Case of Sarcoma of the Fallopian Tube (Un caso de sarcoma de la trompa de falopio). *Cron. méd.*, Lima, 1917, xxxiv, 189.

Among genital tumors those of the tube are the rarest, especially those originating in the connective tissues. The authors report a case of this kind in a woman, aged 40, who came to the hospital on account of abundant repeated metrorrhagia. Some time before a small pelvic tumor was noted. It was not adherent and as it did not cause any trouble no advice was sought concerning it. Its development, however, led her to seek surgical intervention and on the onset of intense metrorrhagia relief was sought. Examination suggested an uterine fibroma. On opening the peritoneum a large solid tumor was found implanted in the right horn of the uterus intimately adherent with omentum and abundantly vascularized. The left tube and ovary were healthy. On further examination the tumor was found to be in the right tube and the ovary was sclerocystic. A subtotal hysterectomy according to the Kelly technique was done. The patient recovered and left the hospital in good condition.

Examination of the tumor showed it to be 19.6 cm. long, 6 cm. wide, and 6.5 cm. thick. Histologically it was a sarcoma. The authors think that this sarcoma of the tube is quite remarkable for its large size; and, so far as they know, is larger than any recorded in surgical annals.

W. A. BRENNAN.

Turrenne, A.: Puerperal Uteropelvic Septic Thrombophlebitis (Tromboflebitis utero-pelviana septica puerperal). *Rev. Assoc. méd. argent.*, 1917, xxvi, 853.

From the study of a case which he relates Turrenne arrives at these conclusions:

1. A rational prophylaxis of septic puerperal thrombophlebitis exists. There are signs, symptoms, and a clinical progress which in the majority of cases permits a diagnosis.

2. Although about half of the cases show a tendency to subside and recover, the high mortality justifies modern attempts at treatment. Surgical intervention, especially ligation of the thrombosed venous trunks, is rational.

3. The transperitoneal route of approach is preferred. All the efferent venous trunks of the genital zone should be ligated. Resection or evacuation of the thrombus will be very exceptional.

4. The results obtained from direct intervention on the thrombosed vessels should encourage new attempts to definitely fix the field of operation.

5. Intervention on the veins is contra-indicated in cases of permanent bacteræmia, in inaccessible thromboses, or in cases of visceral pyohæmic localizations.

W. A. BRENNAN.

EXTERNAL GENITALIA

Bathey, W. W., Jr.: New-Growths of the Clitoris. *South. M. J.*, 1917, x, 486.

The author reports the case of a woman, aged 70, in whom menstruation had begun at 14, and had always been regular. She had borne two children; had no "female trouble"; past history negative.

About one year ago she developed an intense itching of the vulva, but did not notice the existence of a growth of the clitoris. Just prior to the time of seeking medical advice, she noticed a blood stain upon her clothing, suggesting the presence of something abnormal.

Vulval examination revealed the presence of an irregularly shaped, ulcerated growth of the clitoris about the size of a pecan. There was no involvement of the labia, and no palpable inguinal glands.

The operation consisted of a wide excision of the

growth down to the periosteum of the pubic bone. The wound was closed with drainage. The inguinal glands were not removed.

The pathological diagnosis was lymphendothelioma.

EDWARD L. CORNELL.

MISCELLANEOUS

Findley, P.: Hydatidiform Mole. *Am. J. Obst.*, N. Y., 1917, lxxv, 968.

The author gives a review to date of the literature and case reports on hydatidiform mole, a total of 500 cases having been analyzed. This study throws no light on the etiology of hydatidiform mole of chorio-epithelioma.

In these 500 cases cystic ovaries were noted in 58, and in 4 instances retrogressive changes in the ovaries were observed following expulsion of the mole.

Of the 500 moles 157 or 31.4 per cent developed chorio-epithelioma. Combining the statistics of Lockhart and Teacher, Findley finds the recovery rate of chorio-epithelioma following hydatidiform mole to be 47.1 per cent, abortion 35.7 per cent, and full-term pregnancy 33.04 per cent.

In the 500 cases of mole he finds that of the 265 benign moles, there were recoveries in 237 and deaths in 28, a mortality of 10.5 per cent, while of 99 moles which later became malignant there were 45 recoveries and 54 deaths, a mortality of 54.5 per cent.

While it is not possible to make a diagnosis of hydatid mole without seeing the vesicles, the accompanying symptoms are very suggestive. In perhaps 80 per cent of the cases bleeding is manifest in the first trimester. The loss of blood may be continuous or intermittent, profuse or scanty, and not uncommonly results in marked anæmia. It is the opinion of Essen-Moeller that the early appearance of hæmorrhage portends mola destruens or chorio-epithelioma. More suggestive than bleeding is a mucosanguinous discharge since it is an almost constant feature.

In general the management of molar pregnancy is that of inevitable and incomplete abortion. When the hæmorrhage is protracted and before it becomes excessive the cervix should be dilated and the mole removed by fingers or instruments. Inasmuch as but a small percentage will be delivered spontaneously it is wise to follow the expulsion of a mole by passing a curette lightly over the decidual surface.

The author agrees with Caturani that "all forms of chorionic tumors should be treated according to the general criteria adopted for malignant tumors."

C. H. DAVIS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Ancel, P., and Bouin, P.: Determination of the Date of Fecundation in Woman (Sur la détermination de la date de la fécondation chez la femme). *Ann. de gynéc. et d'obst.*, 1917, lxxii, 527.

The study of certain data by the authors suffices to show them the inexactness of the theory of nervous reflex and to conclude that the corpus luteum prepares the uterus for nidation of the ovum in women and mammalian females. In women the shedding of the ovum takes place immediately before the commencement of these uterine phenomena, that is to say, twelve or fourteen days before the menses and not at the end of the menses; or what amounts to the same thing, fourteen to sixteen days after the beginning of the last period. It may be affirmed that fecundation takes place about fifteen to seventeen days after the beginning of the last period, or ten to twelve days after its cessation if five days be allowed for the catamenial flow. The authors agree with the observations of Grynfeldt and Varnier who place the onset of gestation ten days after the end of the last period.

W. A. BRENNAN.

Quarella, B.: Secondary Abdominal Pregnancy, Consecutive to Uterine Perforation, with Living and Active Fœtus in the Intestinal Loops (Gravidanza addominale secondaria, consecutiva a perforazione uterina, con feto vivo e vitale tra le anse intestinali). *Ann. di ostet. e ginec.*, 1916, xxxviii, 481.

The case reported by Quarella is regarded by him on the basis of etiology, as unique in literature. The patient, a multipara of 45 years, entered the clinic in September, the history showing that in the previous April there was an attempt at abortion followed by uterine hæmorrhage, pains, vomiting, etc. There was no particular trouble until July, when there were violent pains in the right lower pelvis, hæmorrhage, and clear symptoms of peritoneal reaction. These phenomena were repeated two or three times until the patient came to the clinic. On examination no foetal sounds nor souffle could be distinguished, but the general symptoms led to a diagnosis of possible extra-uterine pregnancy although there were no clear indications. At operation the uterus was found to be about the size of an adult fist and slightly displaced leftward. Behind it, the Douglas region and the right half of the lower pelvis was occupied by a fleshy mass which had the general aspect of placental tissue. As a matter of fact it was a placenta, the limits of insertion corresponding to the innominate

line posteriorly to the sacral concavity and rectum, and anteriorly to the posterior face of the uterus. There was a normal umbilical cord, and by following this a foetus was found deprived of membranous covering and free among the intestinal loops. This was rapidly extracted. Attempts to remove the ovular tissue caused hæmorrhage, owing to thick adhesions with the uterus, and a subtotal hysterectomy had to be done. The patient rapidly developed signs of cardiac syncope and died on the table.

The foetus measured 33 cm. in length and was developed to the full extent of a 6.5 months' foetus. It did not cry but showed movements. In spite of every care it died three hours after extraction.

The removed uterus showed a breech on its posterior face of about 5 cm. in length which was occupied by the placental tissue above referred to. The uterine cavity was empty. The facts show that the abortion done in the second month of gestation resulted in a large uterine perforation through which the foetus slipped into the abdominal cavity, the sac having ruptured. The placenta was drawn toward the breech and fixed there without losing its vascular connections. The foetus thence developed outside the uterus in the abdominal cavity. The hæmorrhage and peritoneal phenomena experienced by the patient were caused by partial detachment of the placenta and the irritation caused by the presence of the foetus and also free blood in the abdomen. W. A. BRENNAN.

Peterson, R.: Report of a Case of a Full-Term Ectopic Gestation Retained Eighteen Years; Operation and Recovery. *J. Mich. St. M. Soc.*, 1917, xvi, 316.

Peterson's patient reported that eighteen years ago she supposed herself pregnant, having the usual symptoms, foetal motion, etc. Labor did not occur when she was at term but instead the menstrual periods again occurred regularly. The abdominal tumor remained the same size for two years, then gradually became smaller. Recently the patient had lost weight and had not felt well. At the time of operation the tumor rose to the umbilicus, was fixed, cystic to palpation, and clinically resembled a parovarian cyst.

When the abdomen was opened the fluctuating mass was found densely adherent to the parietal peritoneum, omentum, and parts of the intestine. These adhesions were more dense than inflammatory ones. A normal ovary was attached to the cyst wall and a tube could be made out spread over its surface. Considerable loss of blood occurred but the patient recovered promptly from the shock.

The sac contained a fluid resembling pea soup in which floated the bones of the skeleton of a full-term foetus.

W. H. CARY.

Lascano, J. C.: Considerations upon a Sign Observed in Three Cases of Extra-Uterine Pregnancy at Term (Consideracions sobre un signo observado en tres casos de embarazo uterine a termino). *Rev. Asoc. méd. argent.*, 1917, xxvi, 728.

Lascano gives the clinical histories of three cases of extra-uterine pregnancy in which, in the region of the tumor or supposed gravid uterus, there was the sensation on palpation of a soft spongy elastic resistance which suggested the existence of a cyst the limits of which could not be separated from its surroundings. In each of the three cases this point of resistance corresponded to the location in which the placenta was later found to be implanted. In intra-uterine pregnancy at times there is a sensation of sponginess noticed at the site of the placenta; but it is never so clear as in these cases.

In the classical authors little or no attention is given in the description of symptoms of extra-uterine pregnancy to the palpation of the placenta. Lascano calls attention to this sign of sensation of a soft cyst with limits inseparable from the gravid tumor, not that it is diagnostic, but that it is of importance when taken in conjunction with other signs.

W. A. BRENNAN.

Broadhead, G. L.: The Treatment of Eclampsia with Especial Reference to Vaginal and Abdominal Section. *Am. J. Obst.*, N. Y., 1917, lxxv, 762.

From his experience and study of reported cases Broadhead believes that conservative medical and obstetrical treatment will give the best results in the hands of the general practitioner, but is also confident that early vaginal section skillfully performed for cases of eclampsia up to the last six weeks of pregnancy and abdominal section especially in primiparæ, but occasionally in multiparæ, with living children, late in pregnancy, with unchanged cervixes, and particularly with large children and slightly contracted pelvis, will offer the best plan of treatment. It should be understood, however, that the operation to be successful must be performed as soon as possible after the first seizure, and with a minimum of vaginal manipulation.

Spaulding, A. B.: The Management of Eclampsia. *Am. J. Obst.*, N. Y., 1917, lxxv, 773.

The author gives a brief outline of the history of eclampsia from the description of Sauvages in 1759 to the present time. He believes that preventive treatment is of the greatest importance, and in cases of severe toxæmia which do not yield to medical treatment he would induce labor before the convulsions occur. The maternal mortality will then be only slightly greater than with normal labor and if the child is viable this treatment will reduce the foetal mortality of eclampsia.

When convulsions occur, it is of primary importance to put patients deeply under the influence of morphine, chloral, and ether, following which the labor should be terminated with the least possible shock to the patient, and all the avenues of elimination, including bleeding, instituted. Throughout the course of the disease quiet should be insisted upon, which means in the hospital a specially arranged room with trained interns and nurses.

C. H. DAVIS.

Boyd, G. M.: Cæsarean Section in Placenta Prævia. *Am. J. Obst.*, N. Y., 1917, lxxvi, 26.

The author first reviews the opinions of numerous men on this subject, some approving, others opposing, and still others believing cæsarean section indicated under certain conditions. The results of 59 placenta prævia cases in the Philadelphia Lying-in Charity Hospital were reported and his conclusions from a study of these given. Cæsarean section raises the maternal mortality but lowers the foetal mortality. Increased maternal mortality in cæsarean section for placenta prævia over cæsarean section for contracted pelvis is due largely to the poor condition of the patient from hæmorrhage or potential infection due to examinations. The fact that cæsarean section does not necessarily mean a living child in these conditions is against doing a section.

Except for marked pelvic deformity, cæsarean section is indicated only in exceptional cases, as complete prævia and rigid cervix, where the condition of the patient is good and slight possibility of infection present.

W. L. BROWN.

Ley, G.: Spontaneous Rupture of the Uterus. *Proc. Roy. Soc. Med.*, 1917, x, 135.

The patient was 46 years old. The present pregnancy was her twelfth. She had had nine full-term labors, one instrumental, the last being in 1913, and two miscarriages, the last in 1914. She was at full term. The pregnancy had been normal to the thirty-fifth week, when she had a considerable hæmorrhage lasting for one day. Since that date slight losses had occurred at intervals of two or three days until February 9, 1917, when another considerable loss occurred. There had been no pains.

The membranes had ruptured on February 8th. She was seen by a midwife on February 10th and sent to the London Lying-In Hospital. On February 10th she was considerably anæmic. Her temperature was 97° F., her pulse-rate 80. The abdomen was pendulous. The baby was lying as a right occipito-anterior. The foetal heart was heard. On vaginal examination, the cervix admitted three fingers, the canal being long. The head was firmly engaged. The edge of the placenta was felt posteriorly at a distance of 1 inch from the edge of the internal os. It was expected that, with the aid of a tight binder, delivery would be completed without further loss. There were no pains until 9:15 p.m.,

February 11, when, after a labor lasting for one and a quarter hours, the baby was born. There was no antepartum loss and the baby was alive. The third stage of labor was completed in twenty minutes without excessive loss. A troublesome cough caused inconvenience to the patient and nurse during this stage. Ten minutes after the completion of the third stage, the patient complained of sudden dyspnoea. She became restless and her breathing was difficult and labored. The anæmia increased, the pulse became feeble and rapid and she died in fifteen to twenty minutes.

At postmortem examination, the peritoneal cavity was found intact. There was extensive retroperitoneal hæmorrhage into the substance of the left broad ligament, extending upward to the lower pole of the kidney and stripping up the pelvic and descending colon. This hæmorrhage originated from a rent, 13 cm. long, in the left wall of the lower uterine segment.

EDWARD L. CORNELL.

Arnold, J. O.: The Treatment of Placenta Prævia; the More Conservative Methods. *Am. J. Obst.*, N. Y., 1917, lxxvi, 38.

The author discusses conservative methods in the treatment of placenta prævia. Personally he felt that cæsarean section and accouchement force were indicated in certain cases.

The ultimate management of placenta prævia cases depends largely upon the measures used by the physician who first sees the patient, and as this is usually the family physician, naturally the methods used are often not such as would be used in the hospital by the specialist. Painless hæmorrhage alone is sufficient indication for placing the patient in a hospital. Temporarily, to facilitate transporting the patient to the hospital, the family physician can either do a version, controlling the hæmorrhage by pressure of the breech, or tampon the vagina with cotton or gauze. The latter is preferable as a rule with the less experienced.

The tampon has the advantages of aiding dilatation, stimulating uterine contractions, can be done quickly and thus check severe hæmorrhage, and is the most practical in removing patients to the hospital. To be effective the tampon must be put in carefully and under aseptic precautions.

Cases were reported in which conservative methods were employed, and one in which a cæsarean section was successfully done for placenta prævia in a frail, nervous primipara, aged 30, who had had painless hæmorrhage for two or three days. The baby was delivered in good condition.

W. L. BROWN.

Hart, D. B.: The Etiological Classification of Deformities of the Female Pelvis. *Edinb. M. J.*, 1917, xix, 82.

A deformed pelvis is defined as one which offers "bony hindrance from the capacity of the true pelvis relative to the foetal head." This deformity may be at the brim, in the cavity, or at the outlet.

The brim most often presents deformity, usually shortening of the conjugate. In the outlet, funnel-shaped and hunchback pelvises are the most common deformities. In the justminor form, if the head will pass the brim, it will pass the cavity and outlet.

American and British textbooks have almost completely ignored this subject of classification. Many are given, however, in the foreign literature and some of these—Shauta, Budin, Litzmann, and Tarnier—are quoted by Williams and DeLee.

Litzmann's classification, based upon dimensions, is given, but separates deformed pelvises with allied causes, also almost ignores antenatal causes.

Shauta's classification has the objectionable feature of classing antenatal and postnatal causes together.

The author gives his classification which he considers a purely etiological classification:

Group 1. From anomalous antenatal distribution of size—symmetrical.

a. *Æquabiliter justomajor*—an increase in pelvic diameters of at least 2 cm.

b. *Æquabiliter justominor*, non-rickety, which deformity has a male ileum instead of the usual female one.

c. Dwarf pelvis, that of a tiny person, or is to be classed with cretin, achondroplasia, etc.

Group 2. From antenatal losses of determinants at maturation, loss of chromatin determinants, causing absence of certain factors of adult unit characters, as loss of determinant for the sacrum, or of determinants for the size and nutrition of parts of the pelvis.

Group 3. From disturbed and increased or absent leg resistance owing to (a) club-foot, (b) prone pelvis, (c) defects, curvatures, or dislocations of the lower limb.

Group 4. From overweighting of pelvis by early undue pressure in childhood, giving flat non-rickety pelvis.

Group 5. From previous constitutional bony disease, as rickets, tubercular caries, or osteomalacia. The pelvis is not able to resist the downward body weight and upward leg resistance, resulting in deformity, as the flat, rickety, generally narrow pelvis.

Group 6. From tubercular caries of spine, with the pelvis free.

Group 7. From new-growths.

Group 8. From nervous dystrophy.

Group 9. Miscellaneous, and comprising conditions not interfering with labor. W. L. BROWN.

LABOR AND ITS COMPLICATIONS

DeLee, J. B.: Several Everyday Obstetric Problems. *Am. J. Obst.*, N. Y., 1917, lxxvi, 15.

The common occurrence of puerperal infection with its complications resulting in the death of at least 8,000 women annually in this country is noted. Propaganda against typhoid, diphtheria, etc., have reduced the mortality in these diseases

and could well be applied to puerperal sepsis. Not only the mortality, but the morbidity should be diminished. This could be lessened by using as scrupulous a technique in the delivery room as in the surgical operating room. The aseptic operative field should be as small as is consistent with good work, both in the hospital and in the home. The mouth cover, as other protective measures, should be used in the delivery room the same as in the operating room.

An effort should be made to limit the puerperal wounds by using forceps, pituitrin, bearing down by patient, obstetric chair, and bag less, and practicing "watchful expectancy" more.

Correction of some abnormal positions and attitudes of the child are next considered. Most occiput-posterior positions rotate and terminate spontaneously. In some cases the head does not engage, in others rotation does not take place after engagement occurs. If interference is necessary before engagement occurs, version is advised in multiparae, whereas, in primiparae, manual rotation is done by inserting one hand above the promontory, pushing the back well to the front, holding the head in this position by means of the forceps or a volsellum affixed to the scalp until fixation and molding occur. The case is then left to nature, or one may interfere for subsequent indications.

Scanzonian application of the forceps is condemned as it mutilates the maternal soft parts unnecessarily and does not serve as well as simpler methods.

Face and brow presentations are manually corrected by changing them to an occipital presentation, when version seems inadvisable. If necessary, the volsellum is used here to hold the head in place until it becomes fixed in the new position or the forceps are applied.

The second stage of labor is one fraught with many dangers. Many babies are lost during this stage unless these dangers are discovered early and promptly handled. Closer observation of the heart tones by the accoucheur by using a stethoscope which can be worn on the head will help to avoid these dangers.

W. L. BROWN.

Pool, W. P.: Immediate Repair of the Injuries of Parturition. *Am. J. Obst.*, N. Y., 1917, lxxvi, 53.

The author does not believe it practical as a routine to wait for several days to repair lacerations from childbirth. A second anæsthesia and surgical procedure are necessary under operative conditions similar to those immediately following labor. The type of laceration is important rather than the degree. A straight, clean-cut tear with smooth surfaces can be repaired at once as a rule without more anæsthesia during the third stage of labor. Good exposure of the field in deeper tears can be secured by inserting a dry gauze pack high up in the vagina and giving pituitrin to control the bleed-

ing. If the tear is ragged or crooked, as well as deep, he thinks it well to wait till a later time to do the repair.

In complete lacerations, he either repairs the wound entirely at once, or simply repairs the sphincter and leaves the remaining injury to be repaired the next day.

Median perineotomy is often done, in primipara especially, in order to direct and limit the degree of the tear. Such a wound is easily and accurately repaired immediately after labor.

The time to repair a wound which is exposed to infection is when it happens or as soon after as possible.

W. L. BROWN.

PUERPERIUM AND ITS COMPLICATIONS

Macau: A Case of Severe Hæmorrhage Consecutive to the Afterbirth (Un caso de hemorragia grave despues del alumbramiento). *Siglo méd.*, Madrid, 1917, lxiv, 340.

Macau reports the case of a primipara, 36 years old, in whom labor pains had lasted for two days without termination. The midwife had made two injections of pituitrin. Macau found an occipital anterior presentation and terminated the labor by forceps. The child was alive but died shortly after birth. About three-quarters of an hour later normal secundines were delivered, and shortly afterward a hæmorrhage began which could not be controlled by ergot or other measures. No apparent cause could be found, but on detailed palpation the author was able to locate a very depressible zone in a uterine horn which corresponded in part to the placental implantation. He believes the hæmorrhage was due to a paralysis of the zone of insertion of the placenta which prevented uterine contraction. Such cases arise in consequence of an abnormal vascular development which leads to an atrophy of the muscular fibers interposed between the placental vessels, and more so if the placental implantation is in a uterine horn where the musculature is very weak. The author made an intra-uterine tamponade which stopped the hæmorrhage.

W. A. BRENNAN.

MISCELLANEOUS

Balard, P.: Two Cases of Gastro-intestinal Hæmorrhage of the Newborn (A propos de deux cas d'hémorragie gastro-intestinale du nouveau-né). *Ann. de gynéc. et d'obst.*, Par., 1917, lxxii, 569.

The two cases reported by Balard referred to infants born in good condition but in whom gastro-intestinal hæmorrhages appeared on the second day. This was evidenced by melæna, and in one of the cases there was hæmatemesis. The hæmorrhage lasted twenty-four hours and stopped on treatment of gelatinized serum and hemostyl. The cases belong to the hæmorrhages due to a mechanical cause, viz., to circulatory disturbances at the installa-

tion of respiration manifested by a brusque hypertension more or less generalized but especially referred to the abdominal organs.

W. A. BRENNAN.

Schumann, E. A.: *Some Observations upon Antenatal Pathology.* *Am. J. Obst., N. Y.*, 1917, lxxv, 953.

The author reports a very interesting study of observations on antenatal pathology. While the entire period of intra-uterine life, forty weeks, is only a little more than one per cent of man's life, the marked morphological changes and developments during this period are greater than all the physical phenomena which may occur during the entire passage of extra-uterine life.

Mall, working with human embryos, the products of spontaneous abortion, reached the conclusion that the power to become a monster is present in every ovum, provided the conditions surrounding the ovum be inimical to normal development. The generalization is supported by Hertwig's experiments with frog's embryos, producing spina bifida, by the use of sodium chloride.

The changes which may occur during the different periods of antenatal life are discussed, and the general scheme of antenatal life and its divisions shown by charts.

Fœtal disease is often associated with pain or discomfort on the part of the mother, and investigation of such condition should be made with a view to the possible diagnosis of the cause of the symptoms, not only with reference to the mother, but also to the child. The diagnosis of antenatal disease is still almost virgin ground, due to the dearth of detailed observation of the pregnant woman who eventually gives birth to a diseased child. Hydramnion, for example, may be designated, and is known to be frequently associated with monster infants or twins.

Weak, irregular, and arrhythmic fœtal heart sounds may be present in the case of anencephalic or other monsters in which the cerebral and spinal centers are so ill developed that this regulating action of the heart is lost.

A positive Wassermann reaction in a pregnant

woman will prove beyond question that her child will be affected with syphilis.

In conclusion the author urges more careful study of the pregnant woman from the standpoint of the child. The causes of antenatal pathology will gradually attain to a state of workable scientific information, giving to medicine another unit of power for the betterment of our race and species.

C. H. DAVIS.

Placental Transmission. *Lancet, Lond.*, 1917, cxcii, 695.

That the placenta acts as the nutritive and excretory organ of the fœtus is generally accepted, but the proof is chiefly indirect. It is still questionable whether the placenta acts as a transmitter of certain substances by a process of simple diffusion or whether it has the power of altering their chemical constitution so as to render them more readily absorbable, or has the power of rejecting them. The materials necessary for the growth of the fœtus must be absorbed from the maternal blood by the chorionic villi and its waste products eliminated in the same way. That certain bodies can pass from the maternal blood to the tissues of the fœtus has been proved in human subjects.

It is not possible at the present time to assert whether any given substance passes to the fœtus by a simple process of diffusion or whether it is altered in any way by the chorionic villi. As E. D. Plass, in a recent paper in the Johns Hopkins Hospital Bulletin has pointed out, according to the diffusion theory the fluids on each side of the supposedly permeable membrane should contain the same amount of all diffusible substances; whereas according to the secretory theory a difference might occur in the concentration of the same substance on the two sides of the membrane when the need for it was greater in one organism than the other. He concludes that creatinin passes between the mother and child by diffusion.

W. H. Morris showed that the concentration of glucose in the maternal and fœtal blood was such that the placental interchange may be explained by simple diffusion.

V. C. HUNT.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Martin, A. P.: Urinary Renal Infarcts; Renal Calculi Without Symptoms (Infartos renales uricos; calculos renales sin sintomas). *Siglo. méd.*, Madrid, 1917, lxiv, 325.

Martin refers to the existence of latent calculi in the kidney. The history of a youth of eighteen years who came to him showed that at the age of two years there were abnormalities of color in his urine which later disappeared and did not recur.

On examination the right kidney was found to contain 14 calculi. This case is interesting, (1) owing to the absence for many years of pain, urinary disturbance, and other indications of calculus reaction; (2) suppuration established in the kidney as a complication of gonorrhœa ascending from the anterior urethra to the posterior and thence to the bladder; (3) the absence of fever and the tolerance of the organism for an enormous loss of leucocytes.

The absence of pain, hæmaturia, and fever for so long a time, in a case of extensive renal calculi like this, may be explained by a study of a radiograph of the case. The disposition of the calculi is such that they do not occlude the renal pelvic outlet. They remain fixed and owing to this there is no friction nor colliding with the walls of this cavity, nor do they tend to distend it; that is, the elements of renal colic were absent, and the patient was enabled to maintain the appearance of robust health.

W. A. BRENNAN.

Quiros, D.: Polycystic Kidney and Hydronephrosis (Rinon poliquistico e hidronefrosis). *Anal. d. Hosp. de San José*, Costa Rica, 1917, ii, 147.

Quiros' research leads him to conclude that hydronephrosis and polycystic kidney are conditions which have an anatomopathologic similarity, with these differences:

1. Polycystic kidney is generally bilateral while hydronephrosis is unilateral.

2. In hydronephrosis the ureter is usually dilated or otherwise affected while in polycystic kidney the ureter is integral.

3. In hydronephrosis a discreet amount of urea is found in the contents of the sac. This is not so in polycystic kidney.

4. In hydronephrosis, when the whole parenchyma is not involved, the cysts are limited and independent of the remaining renal tissue; in polycystic kidney the cysts are distributed over all the parenchyma, forming a body with it. They are thus conglomerate and without particular delimitation.

W. A. BRENNAN.

Calleja, C.: Renal Tuberculosis; Prevention and Cure with Special Reference to Nephrectomy (Tuberculosis renal; prevencion y curacion con especial referencia a la nefrectomia). *Therapia*, Barcelona, 1917, ix, 272.

The author believes that nephrectomy is contra-indicated in all cases of tuberculous nephritis complicated with pulmonary or abdominal tuberculosis not previously cured, even if there is pyonephrosis which has not previously been eliminated by nephrotomy. Likewise nephrectomy is contra-indicated in cases in which both kidneys are tuberculous with marked deficient functioning in both. Operation is indicated in idiopathic nephrotuberculosis even when the nephrotuberculosis is secondary, because although the chances of a good result are not so favorable as in primary cases the post-operative mortality is not comparable to that occurring when the condition is not operated. Operation, however, should be deferred until vigorous hygienic and medical treatment have been tried and found ineffective in checking the progress of the disease.

W. A. BRENNAN.

Rytina, A. G.: Renal Tuberculosis. *Ann. Surg.*, Phila., 1917, lxxv, 346.

The author reports three cases of renal tuberculosis with unusual features together with his discussion of each case and conclusions.

The value of a complete urologic examination, including renal functional estimates, is emphasized. After such examination the surgeon may with certainty proceed in the face of negative macroscopic and other gross findings at operation.

His conclusions are:

1. A more or less generalized genito-urinary tuberculosis may be present with practically no symptoms.

2. Removal of the more advanced, or offending organ or organs, where possible, may lead to the spontaneous arrest of the remaining ones.

3. Exploratory diagnosis of renal tuberculosis by inspection and palpation at the time of operation is entirely erroneous; indeed, it is possible that bisection of the kidney from pole to pole at the time of operation may fail to reveal the site of infection.

4. Tuberculosis of the kidney may exist in an advanced degree for many years without causing any symptoms referable to it.

G. J. THOMAS.

Maury, J. M.: Acute Hæmatogenous Unilateral Infection of the Kidney; Report of Unusual Case. *South. M. J.*, 1917, x, 567.

The patient, a male, 29 years of age, had been taken sick suddenly 10 days previous with pain

in the right abdomen followed by nausea, vomiting, and fever. He continued having fever daily, nausea and vomiting at irregular intervals and pain and soreness constantly.

On examination his temperature was 101.5° , pulse 112. The abdomen was flat and a mass 3.5 by 2.5 inches could be seen and felt in the right abdomen reaching to within 2 inches of McBurney's point. The mass was hard and moderately tender and could not be palpated through the loin. The total white count was 12,000. The urine contained a few pus-cells, a trace of albumin, and an occasional hyaline cast.

Diagnosis of appendiceal abscess was agreed upon, and an incision made through the right rectus.

The cæcum was found high, the appendix normal, and closely bound to the mass which was in the cellular tissue behind the colon and evidently associated with the lower pole of the kidney which was displaced downward.

The appendix was not removed because it was feared that a pus-pocket would be opened into the peritoneal cavity. An incision through the loin disclosed a perirenal abscess communicating through the ruptured renal capsule with an abscess cavity in the lower pole of the kidney.

Isolating and bringing up the kidney revealed no other lesion, hence it was returned and the wound closed with drainage. Convalescence was slow and was complicated by a metastatic abscess of the prostate.

Montalbo, L.: Alterations of the Sudoriparous Glands in Surgical Interventions on the Kidney and in Experimental and Spontaneous Renal Insufficiency (Sulle alterazioni delle glandole sudoripare negli interventi chirurgici sul rene e nelle insufficienze renali sperimentali e spontanee). *Policlin.*, Roma, 1917, xxiv, sez. chir., 284.

The author thinks that one of the most interesting problems of renal pathology is the relation between renal function and that of the sudoriparous cutaneous glands. He refers to previous work on these lines and especially to that of Pollaci (1903), Cesaris Demel (1908), and Siegel (1908). Montalbo himself has made experimental studies on cats and has also studied some clinical cases. He gives the details of these and sums up his conclusions thus:

1. In unilateral nephrectomy or unilateral ureterotomy, if the renal compensation is integral, there are no cutaneous alterations worthy of note; only slight cystic dilatation of some hyperfunctioning sudoriferous glomeruli.

2. If an acute renal insufficiency is provoked, or in bilateral nephrectomy or ureterotomy followed after recovery by nephrectomy or ureterotomy of the other side, the animals die after about three days and alterations in the sudoriparous glands are found involving the epithelium exclusively, showing the direct relation between the two functions.

3. If a very acute renal insufficiency is provoked, signs of great hyperactivity are noted in the sudoriparous glands with marked hyperæmia and a granulous aspect of the protoplasm. Necrotic phenomena of cellular elements are only slight.

4. With a provoked subacute renal insufficiency of sixteen days' duration there were observed all the signs of an acute inflammation of the sudoriparous glands.

5. In two cases of chronic human nephritis, very marked alterations of the glands were noted, thickening of the connective tissue, pericellular, perivascular, and periglandular infiltration, necrotic destruction of epithelium cystic dilatation of secretory tubules, etc.

6. In a case of nephrectomy for tuberculosis without notable hyperhydrosis, glandular lesions were most evident.

The author's findings perfectly confirm some of those noted by previous observers, especially those observed in human chronic renal lesions, viz., parenchymatous and interstitial alterations of the sudoriparous glands. Such alterations are constant in experimental lesions, and in acute renal insufficiency provoked by ligation of the ureters.

The author discussing the connection thinks that when the kidney lesions are due to toxic or infectious factors, such factors also affect the sudoriparous glands. Certain histologic and physiologic facts brought to light in recent times show that there is some physiologic affinity existing between the secretory cells of the kidney and those of the sudoriparous glands. The author's research has confirmed the findings of Pasini and Demel that the sudoriparous glands do eliminate urea, and that they therefore act analogously to the kidney and are affected by a diseased condition of the latter.

W. A. BRENNAN.

Rowlands, R. P.: Obstruction of the Ureter by an Abnormal Renal Vessel. *Brit. M. J.*, 1917, i, 755.

The author reports 8 cases and emphasizes the importance of abnormal renal vessels as a cause of ureteral kinking and hydronephrosis.

He states that they should be sought for at every kidney operation. If this were done many failures of nephropexy and nephrolithotomy would not be recorded. In 2 of the 8 cases stones had been found in the hydronephrotic sacs.

The artery causing ureteral kinking usually lies posterior to the pelvis and most often is a branch of the renal artery though it may come directly from the aorta.

Usually but one of the four or five branches of the renal artery pass behind the kidney pelvis and then too high to obstruct the ureter. The condition is more often left-sided.

In the pathogenesis a vicious circle is formed. The anomaly, especially with sagging of kidney, causes ureteral obstruction. This produces pelvic dilation and in turn more sagging of the kidney.

Later inflammatory reaction sets up in the ureter at the constricted site and the resulting stricture promotes further hydronephrosis and pyelitis, and stone formation may occur.

The symptoms are those of acute attacks of renal colic, with dull heavy ache in the loin during the intervals.

There may be frequency, pain, or burning on urination, and as secondary changes occur albumin, blood, or pus may be demonstrated in the urine. In late cases tumor in the loin may be palpable and the general health may deteriorate.

The diagnosis is considered in two divisions:

1. Other severe pains of the region, especially appendicular, biliary, intestinal, and pancreatic colic. Lead colic, duodenal ulcer, and tabes are mentioned.

2. Distinguishing the various forms of renal colic, as (1) foreign bodies in the ureter, (2) changes in the ureteral wall, (3) pressure on the ureteral wall.

A routine X-ray is urged and causes of failure of interpretation of positive and negative results are discussed.

An indigo-carmin test is mentioned as of value during cystoscopy to determine the kidney affected.

The treatment, ligation, and division of anomalous vessel suffices in early cases, nephrorrhaphy, ureteropelvic anastomosis, nephropexy, pyelotomy, and nephrectomy depending upon the degree of hydronephrosis and secondary changes. Nephrectomy is reserved for extreme kidney changes.

K. L. VEHE.

Gordon, G. S.: Three Cases of Ureteral Obstruction. *Brit. M. J.*, 1917, i, 758.

The author reports three cases of ureteral obstruction due to hydronephrosis possibly due to abnormal ureteral insertion, congenitally narrow ureteral orifice with prolapse of the ureter into the bladder and diverticulum of the bladder into which opened a double ureter.

The case histories are given in detail. Two of the men, soldiers, had had appendectomies done.

K. L. VEHE.

Covisa: Vesicorenal Reflux and Permanent Dilatation of the Ureter (Reflujo vesico-renal y dilatación permanente del ureter). *Rev. de med. y cirurg. pract.*, Madrid., 1917, xli, 222.

Vesicorenal reflux is very rare, and there are but few cases in the literature. It consists in the back flow of fluid from the bladder and ureter to the kidney which does not occur normally.

Covisa reports a case in a man of 23 who had been treated three times for urinary retention. Micturition was re-established slowly, and with pain and some hæmaturia for which an intervention (vesical dilatation) was made. He improved but later the disturbances and vesical pain returned.

On exploration the left kidney was painful, the right painless. The vesical capacity was 50 ccm. The urine was turbid and of acid reaction. He was treated with gomenol. Cystoscopically ulcerous patches were seen on the bladder, but the ureteral openings could not be discerned. On further examination a kind of diverticulum was seen in the site of the left ureteral meatus; and, on introduction of a sound, a yellowish fluid escaped with some drops of fat. Owing to the employment of gomenol it was therefore thought that there was a vesicorenal reflux. This diagnosis was confirmed on introducing into the bladder a blue colored fluid and finding that it issued by the ureteral sound. On introducing 50 ccm. of collargol into the bladder it was observed that a radiograph showed the left ureter sinuous and dilated, but the right did not show. Urinary separation showed the right kidney less competent than the left. It was logical to think that the left kidney was the one affected, and a left nephrectomy and ureterectomy was done. A short time after this intervention phenomena of uræmia appeared. As the case was extremely grave, one of life or death, the author performed a right nephrotomy and unexpectedly found a kidney with very little renal substance, its center being caseous. The patient died. At autopsy the ureter was found almost completely obliterated. W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Legueu, F.: Vesical Calculus Developed Around a Coin in the Bladder (Calcul vésical développé autour d'un sou chez un blessé de vessie). *Bull. et mêm. Soc. de chir. de Par.*, 1917, xliii, 1457.

During a shell explosion a coin from the pocket of a fellow soldier was projected into the bladder of Legueu's patient, through the inguinal canal. The coin remained there thirteen months when its presence was discovered by a radiograph and it was extracted. A calculus had developed about it.

W. A. BRENNAN.

Sabatini, J.: Treatment of Tumors of the Bladder by Electrocoagulation (Tratamiento de los tumores de la vejiga por la electrocoagulation). *Prensa méd. argent.*, 1917, iii, 372.

From the middle of 1913 to March, 1916, Sabatini treated 31 bladder tumors by the bipolar D'Arsonval high-frequency currents according to the technique of Legueu in 1913. The cases were selected, being mostly tumors of small and medium size and pedunculated, which the author thinks alone should be treated by this method. Disappearance of the tumor is generally effected. The number of applications cannot be determined beforehand nor do they depend on the size of the tumor. There should be an interval of not less than fifteen days between the treatments. The duration of each treatment should not exceed from five to six minutes with frequent interruptions by applying the electrode on different parts of the tumor for some

seconds alone. The intensity of the current varies from 250 to 300 milliamperes and should not surpass 350 milliamperes. The electrode contained in the sound of Legueu's cystoscope is quite ample and leaves in the apparatus a sufficiently large visual field to allow the progress of the operation to be followed during the whole seance, and obviates the necessity of the re-introduction of verification cystoscopes. In the case of large tumors electrocoagulation may be attempted with the object of diminishing their size and above all to prevent hæmaturias.

The results obtained in the 31 cases were as follows:

1. Complete destruction of the tumor in.....	8 cases
2. Marked diminution of the volume of the tumor	7 cases
3. Amelioration of the symptoms (cases still under treatment.....)	5 cases
4. Amelioration of the symptoms (treatment abandoned).....	9 cases
5. No improvement in.....	2 cases
<hr/>	
Total	31 cases

W. A. BRENNAN.

Brin, H.: Intraperitoneal Bladder Wounds (Plaies intrapéritoneales de la vessie). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1086.

Brin does not think that intraperitoneal lesions of the bladder are very grave; generally it is easier to treat them than the generality of visceral lesions: In the scale of gravity they may be classed: (1) The least grave are evidently those which attack the anterior face under the peritoneal cul-de-sac. (2) Then come intraperitoneal lesions. (3) The most serious are those involving the fundus of the bladder or the lower part of the lateral faces, because direct treatment is more delicate and especially because they are often associated with rectal or osseous lesions which lead to general infection.

Although there are some spontaneous recoveries the treatment of bladder injuries is entirely surgical. The technique varies according to the nature of the injury.

1. For extraperitoneal injuries of the anterior face, if high and if after regularization they can be correctly sutured, the practice should be suture with a sound *à demeure*. If the lesion is in the vicinity of the neck, suture should not be tried. The practice should be cystostomy as high as possible and a sound placed after an interval.

2. For intraperitoneal injuries if in the apex or in the posterior face region, intervention should be by resection of the edges, suturing in two places with fine catgut, and placing a sound *à demeure*. The Douglas sac should be closed by a row of sutures, thus carefully isolating the wound from the rest of the abdominal cavity, followed by cystostomy.

As wounds of the fundus are usually produced by perineal projectiles, they necessitate a lateral

perineotomy or even transverse, as wide as possible so that a loose tamponade in contact with the bladder wall may be made.

W. A. BRENNAN.

Crosti, F.: The Treatment of Simultaneous Lesions of the Rectum and Bladder (Il trattamento delle lesioni simultanee del retto e della vesica dell uretra posteriore). *Riforma med.*, 1917, xxxiii, 604.

The author has collected 45 cases of rectal lesions treated at the war hospitals. Among these 14 showed a contemporaneous lesion of the bladder, 2 of the posterior urethra. One of the latter showed a perforation of the left prostatic lobe.

In 9 cases there was urinary infiltration; in 3 a diffuse phlegmon of the pelvirectal space. In the cases with urethral lesions there was ischuria; in the other cases there was more or less abundant flow of urine mixed with particles of fæces, although the orifice of issue was situated high in several of the cases. In the 14 bladder cases there were five deaths.

With regard to the treatment of these cases the usual practice is to prevent infiltration and stagnation of urine in the tissues with consequent infection through the rectal opening.

Although in some cases recovery may be obtained by simple application of a *sonde à demeure* and without treatment of the rectal lesions, in others an intervention must be made with cystotomy and colotomy to draw off the fæces. The first indication is to widely open up all along the tract of the projectile. If there is a bony barrier opposed to reaching the urofæcal collection it will be necessary to use a transversal perineotomy with the Albarran or Jung incision. In order to avoid the constant danger of infection, the formation of a permanent *anus contra natura* for the complete deviation of the fæces is recommended. In the majority of cases after the perineotomy a simple *sonde à demeure* will suffice to cure the bladder lesions and recourse to cystotomy will be rare.

Deviation by colostomy was executed by the author 6 times with only 1 death.

W. A. BRENNAN.

Wright, F. R.: Stricture of the Deep Urethra. *St. Paul M. J.*, 1917, xix, 148.

Wright emphasizes the fact that strictures of the deep urethra of gonorrhœal origin, or approximately 54 per cent of all strictures, yield to gradual or continual dilatation; while traumatic strictures of the same part are not amenable to such therapy but require operative interference. He makes use of the filiform bougie in very tight strictures of gonorrhœal origin and often leaves it in place for twenty-four to forty-eight hours, after which time he is gradually able to insert one or two more until the dilatation has progressed to the point where it can be continued by a No. 10 bougie. The resorption of cicatricial tissue goes on under the influence of continuous gentle dilatation. J. E. EISENSTAEDT.

SURGERY OF THE EYE AND EAR

EYE

Terrien, F.: Improvement of Ocular Stumps with a View to Prosthetics (Amélioration des moignons oculaires en vue de la prothèse). *Arch. d'opht.*, Par., 1917, xxxv, 524.

Terrien considers his subject from the viewpoint of the large number of eye injuries in the European War, and thinks that the matter of a perfect prosthesis is more than merely esthetic as it will effect the chances of employment of men so injured.

The best stumps in regard to prosthetics are natural stumps. Endeavor should therefore be made to obtain them by conservative treatment or by the different methods of amputation (described by the author), or exenteration. But they do not obviate sympathetic ophthalmia, even after optico-ciliary neurotomy and they therefore, cannot be obtained systematically.

When enucleation becomes necessary it should be economic and completed by an autoplasmic graft of costal cartilage in Tenon's capsule, to which the previously detached recti muscles are sutured. Mobility is perfect and the general result is excellent. The cartilage graft is the best method of replacing the deficient stump and better than any exogenous substances to fill Tenon's space, and the author recommends this procedure as the method of choice.

Failing the graft, after simple enucleation the prosthesis will be much improved by artificial pieces mounted on caouchouc shells or even temporarily by a cast of soft wax placed behind the shell.

If the cul-de-sacs are narrow or irregular and cannot receive an artificial eye, progressive mechanical dilatation is simple and efficacious. It is preferable to sanguinary methods of reconstitution which are almost always unsuccessful when mucus is not present.

W. A. BRENNAN.

EAR

Scott, S.: Case of Squamous-Celled Carcinoma of the External Auditory Meatus and Tympanum in a Young Woman Aged 22. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Otol., 129.

The author reports a case of malignant disease which had extensively destroyed the external osseous meatus, while a portion of the growth had invaded the tympanic cavity without destroying its bony walls or ossicles. The patient complained of deafness and purulent discharge from the right ear. The meatus was full of what looked like granulations and a band of scar tissue which bisected the meatus in the region of the isthmus. She stated that she had had intermittent otorrhœa for many years, and

that it had been continuous for the previous twelve months. She had no pain, nor tenderness, nor facial paralysis, nor pyrexia. The deafness was moderate and of the ordinary middle-ear type. Slight dizziness had been complained of, but the labyrinthine reflexes were normal.

The mastoid process was opened and found to contain normal air cells throughout. The meatus was then opened from behind and a tough troublesome bleeding growth, which had spread through the floor of the meatus into the inframeatal tissues of the neck, was removed. The tympanic plate had been destroyed, together with the lower part of the tympanic membrane, the upper half of which was intact, with the handle of the malleus projecting from it. The antrum was then opened and seen to contain more of the growth, which here looked like a polypus projecting backward, but not completely filling its cavity. The incus was seen to be embedded in, but not destroyed, by the growth.

A radical mastoid operation was performed a week later after the histological examination had proved that the disease was carcinoma.

The following features appear to be noteworthy:

1. The total absence of pain while the disease was active.
2. The apparently satisfactory extirpation of the growth.
3. Its evident origin in the meatus.
4. The question of the absolute necessity or otherwise, of removing the lymphatic glands before they become obviously involved.
5. The prognosis in comparison with other cases of carcinoma of the ear.

OTTO M. ROTT.

Welton, C. B.: Indications and Results in the Radical Mastoid Operation with a Résumé of Twenty-six Cases. *Ill. M. J.*, 1917, xxxi, 235.

As to indications, the author mentions:

1. Persistence of pain in the ear or over the mastoid process. Permanent or intermittent attacks of vertigo, due to erosion of the external semicircular canal. Marked cerebral disturbance.
2. The existence of a fetid suppuration for a year or longer and when local treatment to the middle ear for a period of three months has failed to cure.
3. Frequently recurring middle ear suppuration with preceding malaise, slight or severe headache, temperature and mastoid tenderness.
4. Where the disease is not limited to the tympanum and where operation is prophylactic against fatal results coming without signs of pus retention or visible inflammation of mastoid.

5. Where pain and mastoid tenderness supervene upon cessation of discharge, to be relieved when pus begins to flow.

6. Chronic suppurative mastoiditis.

7. An onset of acute mastoiditis during the course of a tympanic suppuration.

8. Fistula of mastoid bone.

9. Cholesteatomatous formation.

10. Labyrinthine vertigo in old healed suppurative cases.

11. Necrosis of bone shown by X-ray.

12. A sclerosing or rarefying osteitis where such condition produces periodic attacks of mastoid pain after all signs of active trouble in the ear have ceased.

13. A narrowing or complete stricture of the external auditory canal which would lead to pus retention.

14. Facial paralysis.

15. Tuberculosis causing the discharge.

16. Any intracranial or sinus involvement or the presence of an oncoming general septicæmia.

17. Neuroretinitis or choked disk in a patient with chronic suppurative otitis media.

18. Where it is desired to take out life insurance.

19. In children when there is necrosis in both middle ear and mastoid cells.

20. Children from 5 up, with 2 years' suppuration in whom there is increasing deafness.

As to the results in the author's series of 20 cases he states that the average time for after-treatment, or until complete cessation of all discharge, was 67 days. The shortest time 8 days, the longest 4.5 months.

The hearing was improved in 13 cases, no change in 10 and an increase in deafness in 3 patients.

In one case a facial paralysis developed after operation but this is clearing up. This occurred in a woman aged 42, in whom the suppuration had been present intermittently for 10 years following scarlet fever.

The general health almost without exception has improved. As to length of time of the discharge prior to operation, the shortest period was 4 years, the longest 16 years.

OTTO M. ROTT.

Cary, E. H.: Aural Phenomena the Result of Unusual Influences. *South. M. J.*, 1917, x, 249.

The author cites several cases with pain in ears and mastoid tinnitus, deafness, and dizziness, which were of a reflex character, the source of irritation being in some instances a spasm of ciliary muscle of the eyes relieved by properly selected glasses, and in others, an impacted tooth.

Attention is directed to the import of knowledge of distribution of fifth, seventh, and ninth nerves.

The author's explanation of the mechanism whereby tinnitis aurium, closure of the eustachian tubes, retracted and hyperæmic drum, and pain in the ears are produced by chronic ciliary spasm is quite interesting and instructive, opening up as it does a field of thought too frequently left untilled by the oto-laryngologist.

The tonic spasm of the ciliary muscle required an enormous number of impulses over the third nerve, hence the sympathetic control became involved in harmonizing these extraordinary demands. The impulses of the sympathetic through the otic ganglion became involved and certain nerve-fibers such as the branch to the tensor palati, tensor tympani, and levator palati lost their control. For instance, the normal eustachian tube is partially closed and is opened in two ways: first by the act of swallowing when the tensor palati and levator palati muscles open it for air to equalize a partial vacuum produced by swallowing a part of the air in the upper pharynx; secondly the sense of atmospheric pressure from without is the signal for pressure to be equalized from within, and thus sense acts as a stimulus to the nerves controlling the tensor palati and likely the levator palati, which then respond by opening the eustachian tubes. These muscles are under sympathetic control, the motor root of the fifth through the otic ganglion goes to both the tensor tympani and the tensor palati. Hence an immediate effect of disturbed impulses would be activity on the part of these muscles, the tensor palati influencing the opening of the tube directly, the tensor tympani indirectly through the relaxation of the tympanic membrane. Then the levator palati becomes involved in its activity through the blunting of sense of necessity. So the eleventh is not active. The air in the tubes and middle ear is more or less absorbed and then we have negative pressure; then the ninth nerve distribution through the otic ganglion becomes disturbed, either directly as the fifth through the sympathetic, or it does so through negative pressure and relaxation of the vessels. Consequent hyperæmia brings about further closure of the tubes, with pain radiating throughout this nerve distribution.

It is distributed to the oval and round windows of the internal ear and in several ways could disturb the labyrinthian circulation, bringing about dizziness. And it is conceivable that the mechanism can be from a point of irritation through any of these ganglion.

OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Grant, J. D.: Case of Symmetrical Fibromata on the Vocal Cords, Removed Simultaneously by Means of the Exhibitor's Forceps. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Laryngol., 83.

The patient, a fish-hawker, aged 36, suffering from extreme hoarseness of eleven months' duration. There were elongated sessile fibromata covering the middle edges of both vocal cords. The fibromata were cut off completely on the left side and almost completely on the right. The voice was at once completely restored. OTTO M. ROTT.

Basile, G.: Indigenous Zymonematosi of the Throat (Zymonematosi indigena della gola). *Policlino*, Roma, 1917, xxiv, sez. chir., 88.

The author gives an elaborate and fully detailed clinical description of a case of indigenous blastomycosis observed in Italy. The lesions located in the mucosa of the mouth, pharynx, and larynx were similar to cases observed in South America. The case by its characteristics is to be referred to the special Brazilian form of blastomycosis of the oral mucosa described by Lutz under the name of Brazilian zymonematosi. The characteristics of the specific parasite isolated and cultivated by the author show it to belong to the genera zymonema. Its aspect is identical to that described by North American authors in Gilchrist's disease or the so-called systemic blastomycosis.

The author treated the patient by iodine and obtained a complete recovery. Brazilian cases usually end fatally. Gilchrist's disease in North America has shown many recoveries. The author thinks that the parasite found by him may be a less pathogenic variety of the American species.

W. A. BRENNAN.

Whale, H. L.: Specimen from a Case of Fatal Hæmorrhage from Gunshot Wound Involving the Superior Thyroid Artery. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Laryngol., 73.

The case is reported of a private admitted November 1, 1916. His temperature was 103.6°, pulse 128, respiration 36, and the bases of both lungs were dull. A rifle bullet had traversed his larynx in the coronal plane, entering on the left side opposite the greater cornu of the hyoid, which was fractured at its junction with the body of this bone, and emerging at the level of the right aryepiglottic fold.

On November 3rd an attack of coughing caused profuse intralaryngeal hæmorrhage, which was unaffected by digital pressure applied to the carotid

artery; and in a few minutes the patient died from asphyxiation.

At autopsy, the lower lobes of both lungs were found to be solid with pneumonia. The trachea and bronchi were full of frothy serum and short broken casts of blood-clots. The course of the bullet corresponded to the clinical appearances. In its transit, it had fractured the left greater cornu of the hyoid at its junction with the body, and, traversing the anterior part of the supraglottic space, had deeply grooved the base of the epiglottis. The right superior thyroid artery at the highest point reached by the upward loop at its origin, had been cleanly severed by the bullet. OTTO M. ROTT.

Arcangeli, U.: Tonsillectomy in Acute Articular Rheumatism, in Endocarditis and Nephritis Due to Tonsillitis (La tonsillectomia nel reumatismo articolare acuto, nelle endocarditi e nefriti ricorrenti da tonsillite). *Gazz. d. osp. e d. clin.*, Milano, 1917, xxxviii, 447.

Arcangeli refers to the importance of tonsillitis as a cause of acute articular rheumatism, and recurring endocarditis and nephritis. From the experiences gained he comes to these conclusions:

1. In a recurring tonsillitis tonsillectomy is indicated not alone to avoid the repetition of the disease, but also to avoid possible complications such as endocarditis, nephritis, pleuritis, etc.

2. In acute articular rheumatism with or without endocarditis, tonsillectomy is indicated to prevent recurrence. These rheumatic attacks of microbic origin are a frequent cause of heart troubles.

3. In nephritis consecutive to tonsillitis tonsillectomy is called for to prevent the aggravation of and even as a cure for the nephritis. W. A. BRENNAN.

Horsford, C.: Case of Laryngeal Cyst. *Proc. Roy. Soc. Med.*, 1917, x, Sect. Laryngol., 75.

In August, 1916, the patient appeared with a large cystic swelling involving the left ventricular band and left aryepiglottic fold and extending into the left pyriform fossa. His dyspnoea was pronounced, and to relieve his distress the cyst was punctured with a cautery point. A large amount of blood-stained gelatinous fluid escaped. Until puncture was done it was impossible to punch out a portion of its wall, owing to its toughness and slippery surface. Although a large portion of its wall was removed, the cyst quickly refilled and on two occasions has burst, with relief to the patient. There has been no material change during the past six months. Report of section is that the material appears to be of an adenomatous nature, with a malignant tendency. OTTO M. ROTT.

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SURGICAL TECHNIQUE

NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

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GENITO-URINARY SURGERY

Adrenal, Kidney, and Ureter

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Throat

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Mouth

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The problem of pulpless teeth. I. C. BROWNLIE. *Colo. Med.*, 1917, xiv, 183.

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INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1917

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Stetson, H. G.: *The Care of the Ambulatory Accident Case.* *Boston M. & S. J.*, 1917, clxxvi, 447.

The author has charge of the emergency work connected with a large accident practice. He emphasizes the two-fold duty of the surgeon: (1) his duty to the injured man; (2) his duty to the employer in properly notifying him of all details concerning the accident, and of the prognosis.

He makes an especial appeal for more systematic records, largely as a protection to the employers of the injured. Business methods should be more generally adopted in professional practice.

J. H. SKILES.

ASEPTIC AND ANTISEPTIC SURGERY

Leigh, S.: *Present Status of Surgical Cleanliness.* *Interst. J. Surg.*, 1917, xxx, 241.

In the light of the present-day knowledge which the profession has to be guided by, the principles and rules of surgical cleanliness are indeed so simple that a child can easily understand and carry them out.

Surgical cleanliness in operative work has taken a step backward during the past two or three years. The average operator does not realize the danger of carelessness, nor the necessity of extreme watchfulness. He does not watch his assistants and nurses closely, nor look after the large number of preparatory details that go to make a clean operation. He takes it for granted that anybody and everything is clean and does not make sure of it. The mixing of dirty and clean cases is often risky.

The most serious problem in surgical cleanliness today is the question of gloves. The hands of surgeons and assistants are often neglected by thoughtlessly handling dirty cases, ungloved, and

making dirty examinations. Many men have gone into surgery in recent years without proper training. Many of the details of successful surgery can only be had in a training school for surgeons, a good hospital, under a good surgical guide. Every conscientious man should make up his mind not to rest until clean surgery can be done without infections. The surgeon must have absolute control of his staff, including the operating room nurses. The ideal plan, of course, would be for each surgeon to have his own operating room and operating staff, even in the general hospitals. A glove used in a dirty case should never, under any circumstances, be used afterward in a clean case. No one in the operating department should be allowed to handle pus or anything soiled with septic matter, except with instruments or with gloved hands, and preferably the former.

Obstetrical cases should be treated as surgical and the strictness in cleanliness should be extreme.

ISIDORE COHN.

Guillot, M., and Woimant, H.: *Application of the Carrel Method in Base Hospitals* (*Application de la méthode de Carrel aux formations de l'arrière*). *Rev. de chir.*, Par., 1917, lii, 1.

While the Carrel method is now fully established as a means of treating fresh war wounds, it has not been determined whether or not it can be applied in the case of wounded sent back to the base hospitals. The authors have endeavored to solve this problem. The first series of wounded received by them and to whom the treatment was applied had lesions dating from a minimum of 2 days to a maximum of 46, or an average of 11 days. The results have shown that in a general manner under the Carrel treatment old wounds evolve similarly to fresh wounds as regards sterilization and closure. The course of treatment followed is: (1) primary

disinfection; (2) intervention if required; (3) sterilization; (4) closure. Irrigation is established by incisions made into the area. After a varying period pus disappears and the number of microbes diminishes. If the bacteriologic curve is found to descend regularly irrigation is continued without modification. If on the contrary it rises for several days and becomes stationary, it shows that there is some cause of infection in the wound and intervention is indicated to suppress it. After operation irrigation is resumed until such degree of sterility is obtained that the wound may be closed. In the case of fractures during this treatment the ordinary methods of extension, etc., are employed. The American apparatus is used which allows extension and suspension in a hammock.

This treatment obviates passiveness in the face of a suppurative wound, and the chance of a spontaneous closure which is always doubtful. The bacteriologic curve indicates the opportune moment for surgical action when suppuration is suppressed and there is little likelihood of reinfection.

The authors give the clinical histories of their cases to show the evolution.

They state that in the Carrel method there is one element which is of equal importance to bacteriologic control. This is the correct preparation of the Dakin solution. This fluid has two characteristics which are: (1) the hypochlorite of soda content between 0.45 and 0.50 per cent; (2) the absence of caustic soda. To satisfy the first condition it is necessary to use a lime chloride, the amount of active chlorine in which is accurately

known. On this value of active chlorine depends the different products to be employed. The second condition is realized by the substitution of a certain quantity of sodium bicarbonate for a part of the sodium carbonate as described by Daufresne (*Presse méd.*, 1916, Oct. 22). Any attempt to sterilize a wound with a liquid not responding to these conditions results in failure.

W. A. BRENNAN.

Pereva, A.: The New Antiseptics and Indications for Their Use (Los nuevos antisépticos e indicaciones de su empleo). *Prog. clin.*, Madrid, 1917, v, 359.

The author reviews the various new antiseptic agents which have come into use during the war and from his study draws these conclusions:

1. For slightly infected wounds or processes which under treatment tend to a complete recovery, i.e., abscesses, etc., the employment of chlorosodium or chloromagnesian agents is recommended.

2. For recent wounds, a smearing with iodine compounds, iodine with benzene preferably, and the employment of the Carrel solution as early as possible is the procedure followed.

3. For infected wounds, bacteriologic examination and employment of alternate antiseptics is advised. In the first group Carrel's solution and oxygenated water are used; in the second oxycyanide of mercury; and in the third boric acid and weak phenol solutions. Vincent's mixture can be used in the last two groups.

The use of antiseptics should be discontinued when the infection yields and should be replaced by physiologic serum.

W. A. BRENNAN.

SURGERY OF THE HEAD AND NECK

HEAD

Means, J. W., and Forman, J.: A Clinicopathologic Study of Early Malignant Conditions of the Face and Mouth. *J. Am. M. Ass.*, 1917, lxxviii, 180.

The authors state that the majority of precancerous lesions represent an incomplete or perverted reaction to some form of chronic irritation. About the face and mouth carcinoma arises from any one of three types of cells, the squamous epithelium, the cells of the hair follicles (erroneously called basal cell carcinoma), and the epithelium of the gland associated with the skin or mucous membrane.

The most frequent is the squamous cell and it is frequently preceded by some lesion, a smoker's burn, or a small trauma frequently repeated over a long period of time, as the irritation from a jagged tooth or from a blister crack or fissure which has refused to heal.

The hair matrix variety is apt to occur above the line of the lower lip, usually as a subcutaneous nodule, which after a period breaks down and

ulcerates. The tendency is to infiltrate widely but not deeply and it seldom produces metastasis.

Only one glandular carcinoma which arose from the floor of the mouth occurred in the group studied. The connective tissue lesions occurring on the alveolar margin are usually referred to as epulides; one type, the giant cell, is the subject of a controversy as to its malignancy.

The authors think the surgical treatment in this region has reached a high degree of efficiency, and if further headway is to be gained against cancer of the face and mouth it must be by educating the public.

D. L. DESPARD.

Riccardo, A.: Scientific Basis upon Which Every Surgical Intervention or Prosthesis in Facial Traumatic Bone Lesions Depends (Enunciative scientifico dal quale dipende ogni intervento chirurgico o protesico nelle lesioni traumatiche delle ossa facciali). *Policlin.*, Roma, 1917, xxiv, sez. *prat.*, 1049.

The facial bones which are of peripheric origin in processes of cicatrization follow metaplastic

modes because their normal ossification is metaplastic. The mandible, for example, is of this nature; it arises from the soft connective tissue. Regeneration in a traumatized area is due to a cellular functional activity of the same modality as the genesis and is quite independent of pre-existing osteoblasts. Regeneration follows the same dynamic and static laws imposed by the function for which it is intended.

It follows as a consequence that surgical art in regenerative processes must aim at the removal of elements specially opposed to the energetic normal development of an organ in its somatic and hence its functional characteristics. W. A. BRENNAN.

Baker, R. H.: Indications and Contra-Indications in the Treatment of Harelip and Cleft Palate.
J. Mich. St. M. Soc., 1917, xvi, 365.

The hereditary factor, as it influences a patient's general health or his environments, the patient's own ability to co-operate in the treatment, his intelligence, his personal hygiene, are all reckoned in a successful result.

The local condition of the ears, nose, and throat is not enough emphasized, according to the author, nor is enough attention paid to postoperative care.

Baker reports sixty-six cases of harelip and cleft palate, treated in the University of Michigan Hospital clinic in the past fifteen months. The ages varied from one week to thirty-two years, and the patients showed a wide diversity of social conditions.

Repair of a cleft in the hard palate is advised as soon as possible after birth; if harelip exists, repair may be done any time not less than five days after wiring of the hard palate, but preferably in early infancy. Repair of a cleft in the soft palate is not attempted before eighteen months, or before the child would normally begin to talk. Patients beyond these ages appearing for operation are advised according to their general condition to stand operation.

Selected horse-hair is used exclusively for coaptation sutures. The palate or field of operation is swabbed with tincture of iodine; argyrol is applied to the suture line before the patient leaves the operating room; the anaesthesia is usually obtained by ether used with Fillebrown's method, given by an expert. A constant suction aspirating outfit is invaluable in these cases.

Postoperative care consists in special diet and the means for antiseptics in the mouth. In infants, feedings are given every two hours and started within two hours after return from operation. These feedings are given by sterile rubber bulb. All nourishment is liquid, and the quantity and caloric requirements are arranged according to the needs of the patient. Cuffs are placed on the elbows. The mouth and nose are sprayed twice daily with 20 per cent argyrol and every two hours with alphozone after feedings; no swabbing or other appliances are used in the mouth. Silver wires in the hard palate remain thirty days; sutures are

left in the soft palate from eleven to fourteen days; in the lip, from six to ten days. The patient is strictly confined to bed, except in adult cases, and rigid contagious precautions are exercised over his room; fresh air is encouraged; special nurses are in charge of these cases, not exceeding four patients to each nurse.

The author believes that the most serious complicating factor to successful cleft-palate work comes from local pathology in the ears, nose, and throat; if present, this is removed before operation. The patient is referred to the Department of Otolaryngology for examination and treatment, if indicated. In the event of operation upon adenoids and tonsils, cleft-palate operation is postponed at least three weeks; discharging ears necessitate a longer period of treatment, and it is with the utmost trepidation that operation is advised in these chronic ear conditions.

The nose is irrigated every two hours with $\frac{1}{2}$ per cent zinc chloride in saturated boric solution; this is also used as a spray in the mouth in more severe coryzas. Argyrol is used as a spray twice a day in the mouth. Operation is not attempted until the local inflammation has definitely subsided.

In a small percentage of cases, excess tissue slough or infection takes place. Postoperative pneumonia may lead to sufficient infection in the nasopharynx to interfere with perfect union. Old scar tissue is not, in itself, a serious complication but as it is so often accompanied by local infectious symptoms, it may prove disastrous. When the sutures have loosened, they should be removed; no attempt should be made to repair the gap in the presence of infection; vomiting, during the first day or two following operation, may cause serious strain on the sutures, but, with Baker, it is a rare complication. For postoperative complications, arising in the ears, nose, and throat, he now finds that zinc chloride, $\frac{1}{2}$ per cent solution in a suitable medium, will control the secretions when they become thick and ropy.

The patient must be encouraged and persuaded by every means possible to refrain from talking unnecessarily. The author advises patients with partial failure of union to carry out the routine treatment, using the silver nitrate, and to wait six months before further operation. In cases of complete failure from infectious causes, six months is the minimum time to elapse before the second operation, other treatment to be carried out in the interval, as indicated.

A résumé of cases since October, 1912, follows.

E. C. ROBISHEK.

Voorhees, B. G.: Sarcoma of the Soft Palate.
Laryngoscope, 1917, xxvii, 632.

The patient was a girl 10 years of age with a growth about the size of a hen's egg in soft palate, extending down so far that the lower part of soft palate could be seen only with difficulty. X-ray

diagnosis was abscess, but on incision no pus was obtained. A diagnosis of sarcoma was then made. One month later the patient died and microscopical examination showed the growth to be a spindle-cell sarcoma.

About 3½ months prior to the patient's death, the family doctor had noticed a small growth on the soft palate and a month later the mother noticed that it was growing rapidly. OTTO M. ROTT.

Gessner, H. B.: Extreme Prognathism Relieved by Bilateral Resection of the Mandible. *N. Ori. M. & S. J.*, 1917, lxx, 176.

The lower jaw of the patient, a white male, 24 years of age, had been increasing in size for the past ten years, until a well-marked prognathism had developed. The family and previous histories were negative. The physical examination was negative aside from the jaw condition.

The orthodontic viewpoint was studied and treated by DeVerges. The bicuspid teeth were removed several days before the operation in order to allow the gums to heal. The operation was performed under local anæsthesia. Incisions were made under the lower border of the mandible on either side, the center corresponding to the bicuspid region. The skin and muscles were elevated and the periosteum divided transversely. On the lingual side the mucous membrane and periosteum were divided transversely without separation. Two lines of section were made on each side with a metacarpal saw, each going through a bicuspid socket. The inferior dental nerves were anæsthetized through the saw tracks, thus relieving the pain. Heavy silver wire was used to unite the lower borders of the fragments on each side and the skin was sutured with drainage. Three interdental splints were cemented, one to the teeth of the anterior fragment and one each to the teeth of the lateral fragments posteriorly. These splints were fixed together by small bolts and nuts. One mental foramen was removed. Four illustrations show the patient before and after operation and the orthodontic apparatus in place. A good result was obtained. The upper teeth are to be advanced later by DeVerges. CARL R. STEINKE.

Colyer, J. F.: Treatment of Gunshot Injuries of the Mandible. *Brit. M. J.*, 1917, ii, 1.

Gunshot injuries differ materially from those incident to civil life in the considerable loss of soft tissue and in the comminution of the bone. The principles involved in the treatment are control of sepsis and approximation and fixation of the fractured ends. Among the dental surgeons the majority attempt immediate fixation with teeth in perfect occlusion. The others consider that the all-important factor is to rid the parts of sepsis first and then secure fixation. At the Croydon Hospital this has been the routine treatment.

The most important step in combating sepsis is

the removal of the teeth in the region of the fracture. When the line of fracture passes through the socket of a tooth the periosteum of the tooth is detached and a pocket is formed which becomes filled with septic matter. The periosteum is entirely destroyed and there is no possibility of its becoming reattached. The result is a permanent pocket from which infection is constantly passing to the fractured area. The pulp of the teeth also becomes infected and each pulp chamber becomes an added source of sepsis. The removal of the tooth or teeth eradicates this focus of infection and healing follows quickly with but little necrosis. The worst effect of the retention of the teeth is met with in fractures involving the molar teeth. In this region swelling of the soft parts adds considerably to the stagnation of septic material about the injured roots. The most striking evidence in support of the early removal of sepsis is the almost complete absence of complications such as bronchopneumonia or intestinal affections.

To obtain osseous union it is essential that the fractured ends be brought into contact or that living bone exist in the soft parts separating them. In the latter case only fibrous union results in many cases. The choice is therefore between firm union with more or less imperfect occlusion or a perfect occlusion but a base incapable of bearing the strain of mastication. In the incisor region the fragments are as a rule allowed to approximate with good results. In the premolar region and especially the molar region the upper teeth opposing the teeth of the posterior fragment are removed allowing the posterior fragment to swing forward and upward. The fragments are now fixed with a splint. If the X-ray shows failure of contact the anterior fragment is brought across until contact is effected. Except in fractures above the angle, the mandible after healing tends to adjust itself to functional activity.

In these high fractures the soft parts of the ramus drop forward against the upper teeth if they are allowed to remain. The patient therefore involuntarily drains the ramus over to the affected side to obtain the "bite of comfort" and faulty occlusion results. A gap of from three-quarters to one inch can be successfully bridged. Where this method fails bone grafts are used.

For fixation the Gunning self-cleansing splint fixed in place with oxyphosphate of copper has been found most satisfactory. C. A. HEDBLÖM.

Sachs, E.: Tumors of the Gasserian Ganglion. *Ann. Surg.*, Phila., 1917, lxvi, 152.

A review of the literature for the last fifty years, reveals only 37 cases of tumor of the gasserian ganglion, 8 of which were operated upon. The chief symptoms are those of severe pain along the distribution of the trigeminal with paresis of the motor branch of the fifth and sixth nerves. This pain is continuous. The author reports one case in which there was double vision upon looking to the

left. It differs from tic douloureux in that the pain is not intermittent and is not relieved by external stimuli or heat. Tic douloureux is not accompanied by nerve palsies. In sinus disease the pain is not as severe or continuous. Pathologically, there are two classes of tumors, those containing nerve elements and therefore growing from the ganglion or including it, and those from the dural covering which compress but do not involve the ganglion.

The author's patient was operated upon by the Cushing technique. The tumor was about the size of a cherry. Symptoms subsided after operation, but there was left a twelfth nerve paralysis and a herpetic blister on the naso-pharyngeal side of the soft palate. About six weeks later, the patient returned with a recurrence of symptoms, and at a second operation the tumor was found to be inoperable. The patient died a few months later from emaciation with glandular involvement in the cervical region.

Histologically the tumor consisted of a loose reticulum of connective tissue interspersed with lymphatic channels and a moderate number of capillaries. Scattered throughout this mass were nests and strands of cells arranged in alveoli which form complex anastomosing columns. Some of the alveoli had lumina, but most were packed with cells. The cellular cytoplasm was finely granular with vacuoles. The numerous nuclei were oval or round and contained deeply staining nucleoli. The tumor was classified as an endothelioma. It was very closely attached to the cavernous sinus and had greatly thinned the ganglion, but did not contain any epithelial tissue.

GATEWOOD.

Peskind, A.: Case of Fracture of the Base of the Skull and Some of Its Characteristic Symptoms. *Cleveland M. J.*, 1916, xv, 776.

This is the report of a case of fracture of the base of the skull, resulting from an automobile accident. The patient, a girl of six years, was brought to the hospital unconscious, with labored respiration and with profuse bleeding from mouth, nose, and right ear. X-ray pictures confirmed a diagnosis of fracture of the base of the skull, involving the temporal, parietal, and occipital bones to the right of the median line.

Four hours after the accident an incision was made below the occipital protuberance, then carried upward in a curved line and brought down to within one inch outside and below the mastoid process. When skin and muscle flap had been pushed aside, two pieces of broken bone were found overlapping, one a fragment of the parietal, and the other of the contiguous occipital bone. Both were loose and were removed. They were about of equal size, each one and seven-eighths inches long and one inch wide.

For three days the temperature ranged between 101.3 and 104° F. Following this, it was normal for three days, then rose again and continued high

for three days. On the third day, the girl was taken to the operating room and the wound opened. An organized clot was discovered and removed. However, this did not affect the temperature and three days later, suspecting infection deeper along the base of the skull, a small hole was made low in the occiput. About 40 ccm. of very dark colored blood was removed, but no pus. After two days of normal temperature, there was a variable fever lasting for nearly a month. At no time was there any marked leucocytosis.

The effects of the injury on the nervous system were very pronounced. There was complete facial paralysis on the right side, the sixth nerve was paralyzed, and the right eye was drawn in toward the nose. The pupils were unaffected by light, as is usual when the pupillary ganglionic fibers are injured anterior to the basal ganglia. The source of the fever, therefore, was irritative, rather than septic. In a case of this kind, it is dangerous to make a positive prognosis for several years.

H. G. SLOAN.

Villandre: Osteoperiostic Grafts in Repair of Cranial Trepanations (Graftes osteo-périostiques dans les réparations des trépanations crâniennes). *Lyon méd.*, 1917, cxxvi, 279.

Comparing the results obtained from the use of osteoperiostic grafts with the results obtained from cartilaginous cranioplasty, bone-plates, etc., Villandre thinks that the osteoperiostic graft has many advantages. Considering tolerance of the graft alone, in 106 cranial reparations the following results were noted:

In 32 osteoperiostic grafts there was no elimination. In 48 cartilaginous grafts there were 2 eliminations. In 22 bone-plate plastic repairs there were 4 eliminations. In 4 lime paste plastic repairs there were 2 eliminations.

The osteoperiostic graft is more resistant than the cartilaginous and has not the easy fragility of sterilized bone-plates. Hence it seems rational to prefer the osteoperiostic graft to other prosthetic methods on account of tolerance and solidity as well as on account of using a living tissue material instead of dead bone tissue which will be absorbed in time.

W. A. BRENNAN.

Head, G. D.: Multiple Hæmangiomas of the Skin Associated with Dyspituitarism. *Arch. Int. Med.*, 1917, xx, 24.

The author reports two cases of multiple hæmangiomas of the skin associated with clinical manifestations of pituitary gland changes. In case 1, the skin of the scrotum, penis, inside of the thighs, arms, back, and abdomen were affected. In case 2, the skin of the scrotum and the mucous membranes of the lips and mouth were involved.

These two cases are described in detail, and a review of the literature given.

GEORGE E. BEILBY.

NECK

Metcalf, W. B.: The Tonsil as a Portal of Entry in Tuberculosis of the Cervical Glands. *J. Ophth. & Oto-Laryngol.*, 1917, xi, 71.

From a review of the literature, the author concludes, and justly, (1) that the tonsils are drained by their lymphatics into the cervical glands; (2) that the tonsils frequently contain tubercle bacilli; (3) that the bacilli may penetrate the tonsillar membrane without leaving any mark; (4) that in a very large percentage, 50 per cent, of cases of tuberculous lymphadenitis, the tonsils are also infected; (5) that the tonsil is an important portal for entry of the tubercle bacilli into the human organism. Orro M. Rott.

Van den Berg, H. J.: Report of a Sarcoma of the Thyroid. *J. Mich. St. M. Soc.*, 1917, xvi, 18.

The report is of a sarcoma of the thyroid in a woman of 58. This growth involved the right lobe and isthmus, having taken on rapid growth two months before in a goiter of 20 years' standing. The left lobe was apparently not involved. The growth was movable, but hard and stiff. She had beginning hoarseness two weeks before. She had become thin, was cachectic, skin was dry and wrinkled. The hair of the scalp, eyebrows and lashes, and pubic hair was thin. There was a complete absence of axillary hair. These changes occurred in the previous half year. There was no oedema of the face and slight oedema of the sacrum. Her pulse ranged between 50 and 70, and temperature was slightly subnormal. This tumor was operated but recurred very soon, growing very rapidly, causing pressure upon the trachea and oesophagus, as a result of which she practically starved to death.

Vigorous X-ray treatments apparently had no retarding influence upon the growth. Permission for autopsy could not be obtained; however, there were no signs of metastasis (pleura, bones). The thyro-prævia signs were very striking and interesting since the left lobe seemed intact. This neoplasm occurred in an old goitrous gland, as is the rule. Sarcomas of the thyroid are rare, only 100 cases having been reported, and of this number only a few in this country.

Weber, F. P.: The Pel-Ebstein Recurrent Pyrexial Type of Hodgkin's Disease (Lymphogranulomatosis Maligna). *Practitioner*, Lond., 1917, xcix, 62.

The patient, a baker aged 46, was admitted to the hospital July 5, 1916, with a history of having had repeated febrile attacks since early in November, 1915. These pyrexial periods had lasted four or five days, and on the average had recurred twice a month, so that he had already had fifteen such attacks. After admission, during an apyrexial interval, no definite signs of disease could at first be made out. The first pyrexial attack in the hospital began on July 13, 1916. This was probably about his sixteenth period of pyrexia and lasted

ten days, but after an apyrexial interval of only four days it was succeeded by another pyrexial period lasting nine days. The next attack followed after an interval of only three days, and similar attacks recurred until the patient's death on November 21, 1916. During the height of the attacks the temperature usually reached about 104° F. On the whole, the attacks increased in severity, and each attack left the patient weaker. From the first febrile attack in November, 1915, to his death in November, 1916, the patient had altogether about twenty-three pyrexial attacks.

In regard to the diagnosis, Weber noted on July 15, 1916, that there was no sign to suggest that the fever was due to Hodgkin's disease; that is to say, that the disease was the Pel-Ebstein recurrent pyrexial type of lymphogranulomatosis maligna. But on July 20, during the same pyrexial period, the spleen seemed already to be enlarged, by percussion note. On September 29, during another pyrexial period, moderate enlargement of the lymphatic glands in the right axilla, together with slight enlargement of those in the left axilla, was observed; the inguinal glands were not enlarged. The spleen was then obviously enlarged to percussion, though by palpation the edge could not yet be felt. On October 20, during the seventh pyrexial period in the hospital, the lower edge of the enlarged spleen could be felt about two finger-breadths below the left costal margin. The liver was then likewise obviously enlarged, the hepatic dullness in the right nipple line beginning above at the sixth rib and the lower edge of the organ reaching about 1 inch below the costal margin. The lymphatic glands were felt in both axillæ, but were apparently not larger than before. The inguinal and cervical lymphatic glands seemed not to be swollen. With the enlargement of the axillary glands the diagnosis of the case became fairly obvious.

In regard to treatment, arsenic by mouth, tincture of chloride of iron, and sulphate of quinine were tried. Repeated small injections of "Khar-sivan" salvarsan were likewise employed, but without any obviously good result. Roentgen ray therapy appears not to be of service in severe pyrexial types of abdominal lymphogranulomatosis maligna and was not tried in the present case.

The patient was Wassermann and Pirquet negative. Blood-counts showed nothing of importance beyond increasing anæmia of a leucopænic type.

At necropsy the spleen was much enlarged, weighing 27 ounces. Its substance was rather soft and contained, scattered throughout it, many white or yellowish-white foci, of about the size of a large pea or smaller, some showing through the capsule. The liver was enlarged, weighing 71½ ounces, and had a nutmeggy appearance. In front of the vertebral column, on both sides of the abdominal aorta, the retroperitoneal lymphatic glands were enlarged, forming conglomerate chains. The mesenteric, like the superficial lymphatic glands, were not

much enlarged. Bacteriologic examination was negative. Histologically, collections of "glassy" endothelial-like cells in the affected lymphatic glands and spleen constituted a striking feature. These cells had small, generally centrally-placed, deeply-staining nuclei and relatively much clear cytoplasm; in appearance they suggested the cells characteristic of the Gaucher type of primary splenomegaly.

The pyrexial stage of Hodgkin's disease may be regarded, Weber thinks, as the stage of dissemination or generalization of the disease, a kind of

"septicæmia of Hodgkin's disease," during which the abdominal viscera, in particular, become more and more involved.

This "chronic relapsing pyrexia of Hodgkin's disease" has sometimes been termed the "Pel-Ebstein symptom," or the "Pel-Ebstein pyrexia," because both Pel and Ebstein (independently) described instances of it in 1887. Even now it is not clear why certain exceptional cases of Hodgkin's disease show this type of pyrexia, whereas in the generality of pyrexial cases the pyrexia is of a quite different type.

P. G. SKILLERN, JR.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Hartung, A.: The Roentgen Diagnosis of Chest Lesions. *Illinois M. J.*, 1917, xxxi, 1.

The author endeavors to point out the value of roentgen examinations in making diagnoses of more or less obscure conditions of the chest over the custom of portraying findings in known lesions. With this in view, various local and general symptoms are interpreted in terms of roentgen findings and roentgenograms shown illustrating the interrelationship. Thus, dysphagia and dyspnoea are ascribed to pathology of mediastinal and closely allied structures. Attention is called to the presence of persistent thymus with asthma and substernal goiter with tracheal compression. Oesophageal strictures, diverticula, and spasms are demonstrated; also enlarged paratracheal and bronchial glands, mediastinal new-growths and aneurisms.

The use of the roentgen ray in acute pulmonary lesions is advocated only in exceptional atypical cases for differential purposes. In the sequela of these, such as pleural effusions or abscess, its value is emphasized not only for diagnosis, but also to assist the surgeon in choosing the best site for operation if such is indicated. In chronic pulmonary lesions, such as bronchiectasis and tuberculosis, attention is called to the extreme care necessary in interpreting various findings, notably hilum shadows, since its main use here is as an adjunct to other clinical and laboratory methods, which it nowise tends to supplant. Malignant disease of the lungs, though rare and usually secondary, should always be thought of when a patient with malignant disease elsewhere develops dyspnoea. This is particularly important if an operation is contemplated. In view of the varied and oftentimes unsuspected pathology the roentgen examination may disclose, its use as a routine measure in all obscure lesions is strongly urged.

Cox, A. N.: Notes on the Drainage of an Infected Hæmothorax. *Lancet*, Lond., 1917, cxiii, 159.

Most wounds of the chest give rise to hæmothorax; they fall into three groups: (1) those

presenting clinical or bacteriological evidence of infection, from the onset; (2) those, at first appearing to be sterile, which in 10 to 14 days show evidence of infection; (3) those running a sterile course throughout.

The first two classes usually require drainage. If the sample of fluid withdrawn shows a very slight growth in culture and the patient is progressing satisfactorily, it may be treated by aspiration alone.

The method of performing resection of rib for drainage, simple thoracotomy, without resection of rib, is not very satisfactory. When definite infection is diagnosed, operation should be done as soon as possible, the operation being resection of a piece of rib, incision of the pleura, and insertion of a wide drainage tube.

The hæmothorax cavity should be drained at as low a level as possible and the tube should have a downward direction, the vertical skin incision making this easy. With an exploring syringe the lowest point from which fluid can be withdrawn is detected and a piece of rib immediately below is resected enough to allow the finger to be inserted. After opening the hæmothorax cavity it can be explored with the finger to sweep out blood-clots and infected material. Wide pieces of thick-walled ordinary drainage are most satisfactory drains. The inner end is cut obliquely and has a lateral hole. The tubes may be held in position by tapes round the chest. The tube is covered by a sterile, spongy gauze dressing. The patient is turned on the healthy side and the tube is taken out and cleaned as often as it becomes blocked. The wound and dressings may be irrigated two-hourly with Dakin's solution. Irrigation of the cavity is beneficial.

Re-expansion of the collapsed lung may be aided by complete healing of the cavity and sinus, avoidance of secondary infection, and progressive shortening and use of narrower tubes. Beir's suction cup is useful, as are simple breathing exercises after the temperature has been normal a few days.

The prognosis as regards life in infected hæmothorax is not unfavorable when the condition is recognized early and proper treatment is instituted.

Elliot states that death from sepsis practically never occurs after the end of the second week. Convalescence is tedious.

V. C. HUNT.

Bradford, J. R.: Gunshot Injuries of the Chest, with Especial Reference to Hæmothorax.
Brit. M. J., 1917, ii, 141.

The observations in this paper deal with cases observed from the third or fourth days up to about three weeks after the occurrence of the injury. Gunshot injuries of the chest are divided into those penetrating and involving the lungs or other thoracic viscera, and non-penetrating. Non-penetrating wounds may give rise to pulmonary and pleural lesions, and a certain proportion of penetrating wounds give no signs of air or fluid in the pleura. Pleurisy and emphysema are the common pleural lesions produced by wounds of the chest wall not involving the lungs.

Hæmophthisis, hæmorrhage, infiltration of the lungs, and pneumonia may follow wounds of the chest wall, and collapse of the lung on the opposite side to the injury. The bruised and infiltrated lung is prone to become infected.

Penetrating wounds of the chest usually produce one or more of the following: subcutaneous emphysema, hæmothorax, laceration of the lung. The hæmothorax or pneumothorax may be on the opposite side from the wound of entry, the missile taking an oblique course.

Bilateral hæmothorax is at times seen and hæmopericardium may occur. Subcutaneous emphysema is usually limited to the vicinity of the wound, at times more extensive, involving the trunk and even the whole body.

Hæmothorax is the most common result of a chest wound, pneumohæmothorax and pneumothorax being rare. The hæmothorax may be sterile or infected. Infection may occur as late as the second or third week, onset characterized by fever, dyspnoea, pain, etc. In a series of 450 cases observed by Bradford and Elliot, infection was present in 117, the pneumococcus bacillus, influenza and ulcer being present in 20 per cent, and streptococci, staphylococci, and anaerobic gas-forming bacilli in the remaining 80 per cent. Anaerobic bacilli were present in 50 per cent of the infected cases.

From the third day to the third week, death from hæmorrhage as a result of a chest wound was rare. Septic infection of a hæmothorax is the most frequent cause of death. Secondary hæmorrhage is extremely rare.

The bloody fluid in cases of hæmothorax consists of defibrinated blood. In infected hæmothorax the pleural exudate is abundant and there are many polymorphonuclear leucocytes. Massive clotting is more common in infected cases. In a considerable proportion of the infected cases there is gas formation, which is usually very rapid. The gas may be free in the pleural cavity or localized above the hæmothorax fluid and below the non-collapsed

portion of the lung. The gas is usually of foul odor, like that of rotten eggs.

The complications associated with hæmothorax are few: purulent bronchitis, pneumonia, pleurisy, massive collapse of the lung, and pericarditis being the most common. Abscesses and gangrene of the lung may occur.

Source of hæmorrhage in hæmothorax as regards its frequency is subject to difference of opinion. However, it is probable that in the majority of cases the source is the injury to the lung, but there are cases in which hæmorrhage is derived from a vessel in the chest wall. In rare instances hæmothorax fluid contains bile due to the injury of the liver.

Signs and symptoms of hæmothorax: Dyspnoea is not a marked feature after the first three days. Fever is usually present but the pulse is not much accelerated. The continued high fever, pain, distress, rapid pulse, and furred tongue should suggest the possibility of infection of the hæmothorax and a sample of the fluid removed. With anaerobic infections, deep jaundice usually develops.

The physical signs of hæmothorax are variable. A very important sign is a high diaphragm on the affected side. Skodaic resonance is often more marked than in simple effusion. Tubular breath sounds are obtained over the fluid and bronchophony and ægophony are well marked. In some cases the signs are those of pleural effusion. In gas-forming infections a cracked-pot note may be elicited.

The chest on the affected side may be enlarged or in some cases the chest is flattened and retracted and immobile in the presence of a hæmothorax. Retraction and immobility of the affected side with a high diaphragm usually means collapse of the lung which is more or less independent of the presence of fluid. Collapse of the lung may occur on the side opposite the injury. In massive collapse the apex beat is displaced toward the collapsed lung.

The main problem in diagnosis is the determination whether a hæmothorax is infected or not. Rapid pulse, pallor, sweating, and collapse are common symptoms of rapidly spreading anaerobic infections. Microscopic and bacteriological examination of the fluid withdrawn will determine the presence or absence of infection. It is at times necessary to explore the chest at different levels.

In sterile hæmothorax, if the amount of fluid is small there is no need for special treatment. If the amount of fluid is large it should be aspirated about the end of the first week. Aspiration with oxygen replacement is better than simple aspiration. At the end of aspiration the patient is left with 200 to 500 ccm. of oxygen in the pleura at a pressure somewhat above the normal pleural pressure.

Free drainage is required in all cases of infected hæmothorax and as early as possible. In some cases in addition some efficient antiseptic should be used. Recently the Carrel-Dakin technique has been applied with success.

V. C. HUNT.

Blancheri: Hæmopyothorax Consecutive to Pleuro-pulmonary Wounds (Sugli empiotoraci consecutivi a ferite pleuro-pulmonari). *Policlín.*, Roma, 1917, xxiv, sez. prat., 1107.

The author treated 17 cases of hæmopurulent pleural effusion consecutive to pleural and pulmonary wounds by single or multiple costal resection and drainage by rubber tube. From his results he concludes that early costotomy with costal resection is preferable to aspiration and to simple pleurotomy since it constantly and rapidly dries up the cavity and allows the lung to expand. It gives to the lung and pleura, not yet irretrievably injured, the possibility of functional reintegration. It obviates the formation of thoracic fistulæ which are often very rebellious to treatment. W. A. BRENNAN.

Dauriac, I. S.: Treatment of Purulent Pleuritis by Continuous Aspiration (Le traitement des pleurésies purulentes par l'aspiration continue). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 115.

Dauriac has been using continuous aspiration for the past two years in the treatment of purulent pleuritis in the wounded. These have been cured with great rapidity in about two weeks generally with no complications.

A rubber tube about 1.5 meters long is introduced as far as possible into the pleura, the projecting orifice being used if possible and a rib resection being made when necessary. The edges of the wounds are sutured around the tube after washing out the pleural cavity with Dakin's fluid. The free end of the tube is connected with a reservoir of ordinary water above the bed with a drip into a receptacle regulated according to the Murphy drip method. By this arrangement a vacuum is created in the pleural cavity through the connecting tube, and as the dripping is continuous, so there is also a continuous aspiration from the pleural cavity. The method greatly lessens the duration of pleural suppurations and prevents the establishment of the often interminable fistulæ. Particulars of some cases so treated are given. W. A. BRENNAN.

TRACHEA AND LUNGS

Crocket, J.: Induction of Artificial Pneumothorax and Its Value in the Treatment of Pulmonary Tuberculosis. *Glasgow M. J.*, 1917, lxxxviii, 66.

The author reports in detail four cases in which he has induced artificial pneumothorax in the treatment of pulmonary tuberculosis. He is enthusiastic over the method because of its simplicity and "its unparalleled value in what previously has been a hopeless type of case."

Since November 1915, he has treated 63 cases by inducing pneumothorax. All cases have been classified advanced. "The results are undoubtedly encouraging." In 23 cases nothing could be done on account of adhesions.

In 21 cases the results were satisfactory: temperature and pulse became normal, cough and expectora-

tion practically ceased, tubercle bacilli could not be found in most cases. In 9 cases the results are uncertain; in 10 cases the results were not good. Crocket describes the apparatus he used. In most cases he used air instead of nitrogen.

The operation of artificial pneumothorax in the treatment of pulmonary tuberculosis is so simple and its results from the point of view of cure are so very satisfactory that one feels that its technique should be much more widely known, and that many more patients with advanced disease, who hitherto have been allowed to go down-hill, ought at least to have the attempt made to induce pneumothorax on them.

It should be noted that contrary to the usual custom, nitrogen gas was not used in compression. Air that was passed through pure carbolic acid and filtered through sterile cotton wool was used. The parts of the apparatus used by the author are described and figured in detail.

Saugman's needle is preferred because it has a much smaller bore than usual. The pain of insertion then is negligible, the blood-vessels of the pleura are not readily injured and pleural effusions, or pleural shock, are less frequent. A stopcock at the point of rubber tube attachment is devised, as well as one where the stilette enters so that the needle can then be used with a record syringe to determine whether or not fluid be present. These are not present on Saugman's needle.

After removing the needle from the chest, pressure should be made on the site of the puncture in order to avoid a surgical emphysema, and afterwards the puncture should be sealed with collodion. A refill may have to be given three or four days every week for a time; later on every fortnight; then every three weeks or every month. It is generally advised that the patient be given an injection of morphia some time before the operation, and that the site of the puncture be anæsthetized with novocaine or some similar preparation. This procedure was carried out for some time but during the past fifteen months nothing has been given. It is a disadvantage to have the patient even partially narcotized.

In a record of nearly 700 injections, on only 2 occasions was there cause for anxiety. The first occurred about an hour after injection. The patient became very cyanotic, the pulse weak and rapid, the temperature went from normal to 102.5° F., there was some respiratory distress. The urine, previously normal, showed the diazo and the Mortiz Weiss reactions. There was some pain on the side of the injection. A few days afterwards the filters were found soaking, which might have been due to some antiseptic fluid having passed over from a filter cylinder when the injection was nearly finished. At that time mercury perchloride was used in the water.

In the second case 1,700 ccm. of air had been injected for the purpose of checking hæmoptysis which had resisted every other form of treatment. This patient did not complain at all during or im-

mediately after the operation but half an hour later, probably due to the expanding of the gas as it became heated in the chest cavity to the temperature of the body, resulting in gradually increasing pressure, the heart had become seriously embarrassed. In several cases a pleural effusion has resulted. It is a very rare thing for this effusion to be transformed into an empyema although tubercle bacilli can generally be found in the fluid by inoculation. All of the cases which developed complications did very well. In two cases after the effusion the induction of pneumothorax was discontinued; the fluid acted as a splint and further injections were not required.

It is absolutely essential before beginning this treatment to obtain the consent and hearty co-operation of the patient. Without these, pneumothorax should not be made. The treatment is one that will occupy not only many months but several years and one may have to wait until six or eight injections have been given before definite indications of real improvement manifest themselves. It is interesting to note that one of the striking things that are observed as the patient begins to improve is the disappearance of tubercle bacilli from the sputum after repeated examination. Saugman, it may be stated, noticed that result in 50 per cent of his cases.

The reason why artificial pneumothorax should be so very helpful is uncertain. The probability is that the collapse of the lung and the continued pressure on it by air injected has the effect of resting the diseased part and allowing the lesions to heal by cicatrization while the other lung, for a time at least, is in a condition of hyperæmia, which helps in its recovery should it also be affected with the disease as is almost invariably the case. There is no doubt that in this method of treatment physicians have a means of benefiting a class of patients that previously no power on earth could help.

ISIDORE COHN.

HEART AND VASCULAR SYSTEM

Wells, S. R., and Goodall, J. S.: Possible Electrocardiographic Sign of Myocardial Change. *Brit. M. J.*, 1917, ii, 182.

The pioneers of cardiology fully realized that grave valvular lesions could be compensated for by efficient heart muscle, but while their methods of examination permitted surprisingly accurate diagnoses of valvular defects, there was by no means the same precision in their methods for determining the state of the heart muscle. Numerous attempts have been made to arrive at a just estimate of the condition of the myocardium in regularly acting hearts, such as the careful consideration of the subjective symptoms, the response of the heart to exercise, the relative intensity of the first apical and the aortic second sounds, the length of the A. V. or P. R. interval, and the inversion of the second ventricular or T-wave of the electrocardio-

gram in at least two of the usually employed leads. These methods all have their use.

The authors, from a study of clinical findings and electrocardiogram tracings in several thousand cases, and also the subsequent history in a large proportion, are increasingly convinced that a very low or absent second ventricular wave (T-wave) indicates a myocardial impairment. Unfortunately marked myocardial degeneration does not yield easily or rapidly to treatment so that suitable cases for observation are not common. Syphilitic myocarditis, however, does yield to treatment. Two such cases are reported with electrocardiogram tracings showing absent or inverted ventricular waves before and well marked waves after treatment.

C. A. HEDBLOM.

PHARYNX AND ŒSOPHAGUS

Mosher, H. P.: Webs and Pouches of the Œsophagus; Their Diagnosis and Treatment. *Surg., Gynec. & Obst.*, 1917, xxv, 175.

Webs of the œsophagus may follow trauma or any disease which causes ulceration. The web may be an insignificant fold attended with indifferent symptoms or it may be large enough to cause severe obstruction in swallowing. Webs of the œsophagus occur behind the cricoid cartilage and neither the fluoroscope nor the X-ray shows their presence. A large percentage of globus hystericus may be webs of the œsophagus. Webs are treated by cutting and if necessary by devulsion with the end of the œsophagoscope.

Diverticula of the œsophagus are classified etiologically as traction diverticula and pulsion diverticula. The former are rare, the latter are said to be due to a hernial protrusion through the weak triangle of the posterior wall, and are caused by the pressure of innumerable boluses of food. Symptoms of a pouch are: gradually increasing difficulty in swallowing until in advanced cases the patient is reduced to a liquid, minced diet; occasionally there is return of food which has been in the pouch for several days. Diagnosis can be confirmed with the X-ray plate and the fluoroscope, and with the œsophagoscope. The author lays special emphasis on the fact that a good œsophageal examination can be made only under general anæsthetic and with the aid of a ballooning œsophagoscope.

Treatment has been along two lines: finding the œsophageal opening and dilating it with bougies, or dissection of the sac by means of external operation. The author describes a new method, namely cutting the common wall between the pouch and the œsophagus. The first step is to locate the opening of the pouch and the opening of the œsophagus, doing so under ether with a ballooning œsophagoscope. Then with the operating window plug through which the scissors punch is passed the common wall is brought out so that it bisects the transverse diameter of the œsophagoscope and then the first

cut is made in the center of it. The œsophagoscope is pushed further down and the second cut is made. These manipulations are repeated until the common wall is slit to within one-eighth of an inch of the bottom. This small rim is left to avoid opening the mediastinum. There is but slight bleeding, a clear field being kept by suction. After operation the patient is fed per rectum for two days; bougies

are passed at the end of a week. The ultimate fate of the sac after cutting of the wall has not yet been determined. The results in three actual cases lead the author to conclude that the procedure is easily accomplished, is probably safe, and that it results in a clinical cure. If it should prove that the slit made by a knife should reunite, a cautery could be used.

R. B. BETTMAN.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Corbett, J. F.: Peritoneal Adhesions. *Surg., Gynec. & Obst.*, 1917, xxv, 166.

The author draws the following conclusions from a clinical and experimental study together with a review of the literature:

1. Adhesions are benign in their intent but may become perverted.
2. Adhesions if left alone tend to disappear spontaneously.
3. Of the various etiological factors infection seems to be the most important.
4. Trauma intensifies the effect of infection.
5. Ether seems to be the most satisfactory chemical means of combating infection. It is not devoid of danger, and is not always effective.
6. Postural treatment is an important question in minimizing the symptoms of adhesions.
7. Omental grafts may be used in covering raw surfaces, but should never be used in the presence of infection.
8. The use of citrate and oil does not seem to be justified.
9. Foreign bodies, such as Cargile's membrane, in themselves produce adhesions, and oftentimes very undesirable adhesions.
10. Hematomata are a cause of adhesions.
11. The cautery is a useful agent in preventing adhesions.
12. Section of nerves as may occur in the right rectus incision predispose to adhesions.

Lerda, G.: The Therapeutic Value of Ventral Decubitus in the Drainage of Surgical Peritoneal Infections (Sul valore terapeutico del decubito ventrale nel drenaggio delle infezioni chirurgiche peritoneali). *Gior. d. r. Accad. di med. di Torino*, 1917, lxxx, 119.

Drainage of suppurative foci in the peritoneal cavity is in practice frustrated by two main obstacles. The first is the difficulty of making surgical openings which assure the flow of liquids into the lowest points; the second is the facility with which intestinal loops tend to adhere among themselves and to the parietal peritoneum.

As regards adhesions, the author merely wishes to state that owing to them the suppurative foci tend to become shut off into small independent

cavities which easily escape observation. The recently introduced processes of installation of fatty substances which impede coalition of intestinal loops have not yet arrived at that stage when a definite judgment can be passed.

The author refers to the Murphy-Fowler and other methods of securing an effective peritoneal drainage and shows their limitations. He thinks that transrectal and pararectal drainage (and drainage through the posterior fornix and in the Douglas in woman) alone effect a satisfactory outlet in the lowest point of the pelvis, but technical difficulties and the danger of sepsis make such methods very exceptional.

A consideration of the subject leads the author to the view that when a peritonitis is diffuse, when its area is vast and irregular, when the incision has been on the median line, the position of lateral decubitus does not suffice for drainage. Ventral decubitus alone in such eventuality secures ideal drainage, because with this position the anterior median incision becomes in truth the lowest point and into the cavity in which it is made the fluids naturally flow.

The actual realization of the position offers fewer difficulties than theoretical considerations would seem to indicate. By the aid of cushions, etc., the great majority of patients will adapt themselves after a few hours to this type of decubitus which does not prevent eating or drinking, reading or repose. The pressure to which the abdomen is subjected although somewhat troublesome at first becomes less so in time, and has certain advantages, such as diaphragmatic respiration and prevention of intestinal distention, which are desirable from the surgical standpoint.

W. A. BRENNAN.

Bevan, A. D.: General Principles of the Operative Cure of Inguinal, Femoral, and Diaphragmatic Hernias; Demonstration of Three Cases. *Surg. Clin. Chicago*, 1917, i, 21.

The history of the surgery of inguinal hernia is given. The various suture materials are discussed and all discarded with the exception of catgut which answers all purposes.

As to anæsthetic the author states that a good surgical risk may be operated upon either under ether or local anæsthetic. Great emphasis is laid

on the absolute contra-indication of strangulation to a general anæsthetic. All strangulated herniæ are very bad risks and should be done under local anæsthetic. The patients may be strangled by vomitus if put to sleep or they may and frequently do get aspiration pneumonia.

Lung infarcts are common after hernial operations due to rough handling of and thrombosis in the spermatic veins. A postoperative hernia patient's urination must be carefully looked after. If these patients cannot urinate lying down they may be allowed to stand or to sit on a commode. The bladder must not be allowed to distend so as to make catheterization necessary on account of the possibility of bladder infection.

For local anæsthesia apothesine, a synthetic preparation made in America, replaces the German novocaine. It is used in 0.5 per cent of 1 per cent strength with 1/100,000 adrenalin. As much as 5 ounces of a 0.5 per cent solution have been used without toxic effect and without interference with primary union. The author has used it in a great variety of operations including a very extensive thyroidectomy. It does not decompose on boiling.

Most inguinal and femoral herniæ occur in congenitally existing hernial sacs. In over 300 cases of undescended testes, even those in which the testicle had not left the abdomen, a peritoneal pouch existed passing to the scrotum.

A femoral hernia was operated upon and the details of the procedure presented. A diaphragmatic hernia of the stomach which had been diagnosed by the aid of the X-ray was shown. At operation it was found that the diaphragmatic defect was due to an abnormally large oesophageal opening. In the repair the edges of this opening were sutured and then the greater curvature of the fundus was sutured to the diaphragm to insure further against recurrence.

K. L. VEHE.

Maidagan, I. M.: Solitary Hydatid Cyst of the Mesentery (*Quiste hidático unico del mesenterio*). *Rev. méd. d. Rosario*, 1917, vii, 261.

Maidagan reports a case of solitary hydatid cyst of the mesentery in a girl 4 years old, who was operated upon after a diagnosis of encysted purulent peritonitis, probably pneumococcic. The cyst was firmly implanted in the mesentery and highly vascularized. Part of it was resected and part marsupialized, owing to the operative conditions met with which would have made total enucleation very dangerous. The child recovered.

In the statistics of Cranwell and Herrera Vegas, among 419 hydatid cysts in patients ranging from 3 to 15 years of age, a mesenteric localization was noted in only 2 cases. In Garcia's statistics (1906) which referred exclusively to children, not a single case is noted. De Pena of Montevideo operated upon such a case in a child 17 months of age. This cyst measured 34 by 25 cm. and was of very great clinical interest on account of its size, location, and the age of the patient.

W. A. BRENNAN.

GASTRO-INTESTINAL TRACT

Balfour, D. C.: Surgical Significance of Gastric Hæmorrhage. *J. Am. M. Ass.*, 1917, lxi, 465.

It should be emphasized that the surgical significance of gastric hæmorrhage demands:

1. The proof that a gastric hæmorrhage has taken place.

2. The determination and eradication of the originating cause, whether chronic surgical lesions in the stomach or extrinsic foci.

3. The treatment of the hæmorrhage *per se*, the general indication being to carry out operative treatment during the interval between hæmorrhages.

4. The recognition of the possibility that many of the extrinsic causes of gastric hæmorrhage are toxic in nature and that the infection takes place by means of the portal circulation through the liver.

5. That not only is the liver of first importance in these heretofore unexplained hæmorrhages, but the spleen, by reason of its close association with the liver, is probably an important factor in the problem.

EDWARD L. CORNELL.

Bassler, A.: Diagnosis of Early Cancer of the Stomach. *N. Y. M. J.*, 1917, cvi, 252.

Bassler says to go after the diagnosis directly and diagnose away from cancer, rather than to begin with a hazy idea of all the abdominal troubles. Judging from the histories of cancer cases he has seen, in a vast majority there is no history of ulcer. It seems true that the vast majority of the people who have suspicious histories of chronic ulcers are resistant to cancer and do not acquire it. Up to 3 years ago, 320 cases of gastric cancer had been examined by him. A history suggestive of ulcer was present in 16. After a negative Wassermann operation was advised in all. Of the 284 cases deemed good or fair enough for recovery from the immediate effects of exploration, 192 were operated upon and all are dead as far as he knows. In fact 279 of the whole are dead.

In but 8 cases was the possibility of complete cure marked and extensive excision was done in each one, with removal of glands in four. Three had return of the growth in the stomach or abdomen, and one had cancer of the breast removed and is still well. The other 4 are well. They all lived practically 3 years after the diagnosis and operation. The early examination in these 8 cases showed obstruction at the pylorus and definite gastric symptoms due to obstruction from the cancer and not to the cancer itself. It is this obstruction that he wishes particularly to emphasize as all his early cases had it. The laboratory findings in the 8 cases proved the obstruction in all and the X-ray in all but one. Traces of blood were found only in one case in the test meal and stool. Hydrochloric acid was present in all but one. The Wolf-Junghaus test, made in 7 cases, was negative in 6 and questionable in one. None had Saxyl-Solomon urine.

The X-ray showed a distinct defect in the anatomy in 7 cases and over six-hour stagnation.

The most important factor in diagnosis is the history, says Bassler. The history of one case is given and illustrations are shown.

CARL R. STEINKE.

Boggs, R. H.: Value of Roentgen Rays in Diagnosis of Carcinoma of the Stomach. *N. Y. M. J.*, 1917, cvi, 341.

The author states that by proper use of the roentgen rays carcinoma of the stomach can be recognized earlier than by clinical methods and other laboratory findings. It aids not only in the diagnosis but determines the location and extent of the lesion, thus insuring a more accurate prognosis. To be reliable, examinations should be made by competent medical roentgenologists who are thoroughly familiar with the pathology and clinical course of the disease.

Gastric carcinomata are classified under three heads from a roentgenologic viewpoint: (1) early carcinoma in which it is difficult to diagnose by the roentgen rays and clinical and laboratory findings; (2) latent cancer which is usually advanced without any typical symptoms and can be readily diagnosed by the roentgen ray; and (3) cases in which there is very little doubt about the diagnosis from a clinical standpoint.

Regarding the question of how early gastric carcinoma can be diagnosed by the roentgen ray, the author quotes Carman in stating that it depends upon: (1) the character of the cancer, whether a frank tumor, an insidious infiltration, or a cancerous ulcer; (2) its situation; (3) the examiner's familiarity with the work; and (4) the amount of roentgenological evidence, together with the extent of clinical corroboration.

The diagnosis is best made from a study of a number of serial roentgenograms and by the physiological action of the stomach on the fluorescent screen. It is based on the presence of anatomic defects or functional disturbances or on both combined. Allowance must be made for extraneous factors such as extra-gastric tumors, adhesions, etc., which may produce deformities of the stomach outline. The picture presented depends upon the type of tumor, its location, and extent of involvement. Filling defects to be pathognomonic must be constant and must not change in location after palpation, administration of antispasmodics or repeated examinations.

Various differential points are mentioned to distinguish between hour-glass stomach produced by gastric carcinoma and ulcer. Spastic incisura as a factor in the diagnosis is also dwelt on and its significance in different conditions mentioned. Motility or emptying time in gastric cancer depends upon the changes which have taken place. The degree of dilatation present may be of value in determining the nature of the obstruction. Alterations in peristalsis have a diagnostic bearing on

carcinoma of the stomach. A picture similar to gastric cancer may be presented by syphilis of the stomach; a Wassermann, clinical history, and therapeutic test serve to differentiate them.

ADOLPH HARTUNG.

Devine, H. B.: Chronic Ulcer of Stomach and Duodenum; Surgical Treatment and End-Results. *Med. J. Austral.*, 1917, ii, 89.

Indications for operation in chronic ulcer of the stomach and duodenum, according to the author, are the following: (1) recurrence of ulcer under medical treatment; (2) secondary gastric pathology as pyloric stenosis; (3) occurrence of persistent or dangerous hæmorrhage.

The author cites data in 11 cases in which the ulcer was resected, 15 cases of gastro-enterostomy, 6 cases of gastro-enterostomy with binding up of ulcer by fascial transplant, and 5 cases of partial gastrectomy. His operative technique for gastro-enterostomy, partial gastrectomy, and resection of ulcer then follows. In some cases of gastro-enterostomy, he completes the usual operation by resecting a strip of rectus fascia, bandaging it around the ulcer several times and covering it over by a Lembert serous suture. The general technique common to all stomach operations is then described and the following deductions are drawn from a series of 38 cases:

1. Gastro-enterostomy for a lesser curvature ulcer may result in a failure or a cure.
2. Wide resection of an ulcer almost to the greater curvature, unassociated with pyloric stenosis, resulted in all cases in a permanent cure. Post-operative distress was noticeably absent and no gastro-enterostomy was necessary.
3. Cases of post- or prepyloric ulcer with marked stenosis did well with simple gastro-enterostomy.
4. The autoplasmic rectus sheath graft with gastro-enterostomy can be used with success in some cases of pre- or postpyloric ulcer where there is no stenosis and especially where there is a tendency to bleed.
5. Stomach operations lend themselves to stage operations, and often this is the surest way to successfully terminate the surgical treatment.
6. Surgical treatment should fit exactly the set of surgical pathological conditions present, and the surgeon cannot have all this knowledge without a careful and thoughtful pre-operative X-ray and clinical examination.

H. H. FREILICH.

Greggio, E.: Gastro-Duodenal Ulcers (Das ulcères gastro-duodénaux). *Arch. de méd. expér.*, Par., 1917, xxvii, 533.

In this extensive and well documented article the author, of the Institute of Surgical Pathology in the University of Padua, Italy, reviews the whole question of gastro-duodenal ulcers and particularly their pathogenesis and the experimental researches which have been made concerning them.

Greggio has for a number of years personally

carried out experimental research work on dogs and rabbits. As regards the dependence of gastric ulcer on intra-abdominal processes, advanced by some investigators, he has never been able to prove that an abdominal lesion led to gastric ulceration. Neither by the ablation of the omentum, direct lesions of the mucosa, experimentally produced gastritis nor pyloric insufficiency could he demonstrate the production of gastric ulcer.

Greggio's researches have given some positive results only after resection of the pneumogastric nerve. In rabbits his experimental results confirm those of several authors; after the unilateral or bilateral resection of the pneumogastric nerve by the abdominal route, a true ulceration of the gastric wall can be obtained. In dogs, the positive results obtained by resecting the pneumogastric nerve are only those obtained by Antonini and the author. They are very few, but even a small number of positive results, the author thinks, are sufficient to confirm the theory that a morbid process depends upon an experimental lesion. After vagotomy the author has obtained in rabbits and dogs a stomach lesion having the character of chronic ulcer. But he has no sure results which show with sufficient probability the formation of gastric ulcers after bilateral vagotomy.

Confining himself therefore to hypotheses, the author thinks that resection of the pneumogastric nerve may be the cause of alterations in gastric mobility, of obstacles to the passage of gastric contents into the intestine and of dilatation of the stomach, either related or unrelated to an ulceration of pyloric mechanism. To such alteration can be added modifications of the gastro-pancreatic secretion or alterations in the cells of the mucosa which may diminish their capacity for drawing from the blood the substances necessary for their defence against digestion by the gastric juices.

The whole question is complex because it is bound up with others relative to the modifications which may be effected after vagotomy not only in the stomach but in other organs and tissues.

W. A. BRENNAN.

Taylor, J.: Perforations of Stomach and Duodenum. *Lancet*, Lond., 1917, cxci, 241.

The author is stationed at the central surgical hospital of a large military camp. In such a camp one might think that cases of gastric or duodenal perforations would be sent to the hospital early, but for various reasons this was not the case, very many cases being admitted in the later stages of the illness after general peritonitis had developed. The chronic ulcer with a great deal of thickening and usually a long gastric history was the usual type found. Most of the cases were drained. Very little time was spent in swabbing out the abdomen and only in one case was the use of saline irrigation attempted.

A mortality of 25 per cent is reported by the author. The prognosis depends upon the time intervening

between the perforation and the operation. In unoperated cases the mortality was 95 per cent.

R. B. BETTMAN.

Bottomley, J. T.: Some Recent Experiences in Gastric and Duodenal Surgery. *Boston M. & S. J.*, 1917, clxxvi, 629.

The author reports his experience with 15 cases: 8 chronic ulcers of the duodenum, 1 chronic ulcer of the duodenum with subacute perforation, 3 chronic ulcers of the stomach, 1 case of co-existing gastric and duodenal ulcers, and 2 cancers of the stomach. The treatment consisted of 8 gastro-enterostomies with infolding of the ulcer, 1 gastro-enterostomy with suture of perforation, 1 gastro-enterostomy alone, 1 "sleeve" resection of the stomach and pyloric portion of the stomach, and 1 exploratory operation. There were 2 deaths: one from gastric dilatation where posterior gastro-enterostomy with infolding of the ulcer was done, the first time in the author's experience in gastric surgery; the second was a chronic duodenal ulcer in which posterior gastro-enterostomy and infolding of the ulcer was done. This patient developed a subphrenic abscess which was drained but showed no escape of gastric or duodenal contents and there was no demonstrable connection between the field of operation and the abscess. The second operation was performed by another physician. This is the first case Bottomley has seen where subphrenic abscess followed unperforated ulcer of the duodenum.

CARL R. STEINKE.

Grulee, C. G.: Diagnosis and Treatment of Congenital Pyloric Stenosis. *Cleveland M. J.*, 1917, xvi, 387, 459, 527.

The diagnosis of congenital pyloric stenosis is usually easily made. Vomiting is the most striking and alarming of all the symptoms and is the one which indicates the seriousness of the condition. Accompanying the vomiting and the direct result of the same is a decreased passage of feces. This has been called constipation. It is not in the true sense of the word, but is due to a decreased quantity of fecal formation because of the small quantity of food reaching the bowel.

The general condition of these infants is oftentimes strikingly good, when the degree of starvation resulting from the vomiting is taken into consideration. The temperature, as a rule, is within normal limits. The weight curve is of considerable interest. Not infrequently it has a steady, though not marked, upward trend, following the initial loss after birth. A total loss of 200 grams in one day is not uncommon. This rapid loss of weight is a danger signal and, when it occurs, it is exceedingly poor judgment to delay operation.

It is usual in these cases to see quite distinct epigastric distention. Antiperistalsis is often spoken of in these cases, but in the author's series of 18 cases it has been very unusual. Even when the stomach has been watched carefully during severe

vomiting, it has not been possible in any instance to determine that there is a relationship between the antiperistalsis and the vomiting.

The examination of stomach contents in cases of congenital pyloric stenosis has revealed nothing of value. It might be supposed that X-ray examination might be of distinct diagnostic value in these cases, but it has not proved to be of much value.

Two things are to be noted: First, there is a delay in the time when the stomach begins to empty, and it is the rule rather than the exception that no food can be demonstrated in the intestine one hour after the ingestion of the bismuth meal; second, there is found in the stomach from six to twelve hours after ingestion of the meal a considerable quantity of the bismuth. While these conditions are rather suggestive, they are by no means diagnostic.

Differentiation of this condition offers as its chief difficulty pylorospasm.

Two other conditions present themselves for differential diagnosis. These are so extremely rare that they need only to be mentioned. In the first a shortened ligament kinks the bowel just beyond the pylorus. The second condition is that reported by Downes, where a small tumor was found projecting into the pyloric orifice.

The great question in the treatment of congenital pyloric stenosis is whether these cases must be operated upon or not. The position must be taken that when the diagnosis of congenital pyloric stenosis is made, the indication for operation is definite. A few years ago the results of operations for congenital pyloric obstruction were so uncertain that physicians hardly felt justified in recommending surgical treatment. The high mortality even at this time was not entirely due to the operative technique employed, for many of the cases were not recognized until they had become poor surgical risks, and, even when recognized, medical treatment was continued so long that the infant was turned over to the surgeon for operation as a last resort.

Only two of a number of operative procedures which have been practiced have proved to be sufficiently satisfactory to warrant adoption. These are posterior no-loop gastro-enterostomy and pyloroplasty.

Out of 17 cases operated upon, 3 were lost, giving a mortality of 17.6 per cent. In 12 cases a posterior no-loop gastro-enterostomy was performed with three deaths. In the last 5 cases a Rammstedt pyloroplasty was performed. The first 5 babies recovered. The sixth died of peritonitis, following opening of the abdominal wound on the morning of the fifth day. The convalescence up to this time had been especially good and, at the autopsy, the gastro-enterostomy had apparently healed. The seventh baby died at the end of a week from perforation of the anastomosis between the stomach and intestine. The eighth died after forty-eight hours and, at the autopsy, the cause of death could not be determined.

The gastro-enterostomy has been the posterior no-loop type and has been done with clamps. In all of the cases there has been a well marked tumor. No difficulty has been experienced afterward from using clamps in doing the gastro-enterostomy.

More difficulties have been encountered in the healing of the abdominal wall than of the gastro-enterostomy. Some of this difficulty may be due to the incision employed which passed directly in the median line through the linea alba. Downes recommends an incision through the rectus to the right of the median line. There has been no trouble with the incision since circular strips of adhesive plaster about the abdomen have been used, applied over a roller bandage.

Anæsthesia is of prime importance in these cases. Ether has been given by the drop method in 15 cases and chloroform in one. None of the babies suffered shock after the operation.

The most important point in the postoperative treatment of these cases is that of feeding. It is usually wise within six hours after operation to attempt to give these children some water by mouth, this to be followed within two hours by a small amount, perhaps one-half ounce, of breast milk. As a result of these attempts vomiting of a small amount of greenish liquid almost always occurs. This rarely contains the milk which has been ingested, nor the curds of the same. These children should not be fed oftener than every four hours, the quantity of food being gradually increased from one-half to three-fourths ounce. Depending upon the severity of the case and persistency of vomiting, it will require from one to two weeks to get the child on the required amount of food. Oftentimes the child is so depleted by the previous course of the disease that it is necessary that the fluid content of the body be kept up. For this purpose it is quite possible to give rectal enemata. In many cases it has seemed wise to give feedings rectally.

Following operation there is no advantage in giving drugs other than those for stimulation, such as strychnia, camphorated oil, etc.

EDWARD L. CORNELL.

Bartrains, W. H.: Duodenal Ulcer in Infants; Report of Four Cases. *Wis. M. J.*, 1917, xvi, 85.

The author reports four fatal cases, because they represent a group. The infants had the same environment, and they suggest an epidemic form. The deaths occurred during a period of six months. Very little of value was obtained from the family and personal histories. The infants were on the same milk formula that had been used by many others, but were anæmic and poorly nourished. Three of the four were males. Their ages varied from forty-one days to seven months and seven days.

Diagnosis: (1) pain on taking food, (2) uneasiness, (3) distended abdomen, (4) œdema, (5) blood in vomitus or stools, (6) perforative symptoms. Un-

doubtedly many cases are undiagnosed, as eleven cases reported by Entz were not diagnosed during life.

As regards the etiology, the following have been found to be the exciting factors:

1. Tuberculosis. May have other lesions of a tuberculous nature.

2. Cases of syphilis are rather rare, but some have cleared up under antiluetic treatment.

3. In regard to burns, Moynihan does not believe that burns in any way influence ulcers. Those cases reported following burns were before the days of antiseptics and large pockets of pus were to be found under the burned areas—probably due to septic emboli.

4. In carbohydrate fermentation, undigested carbohydrates in the stomach favor bacterial decomposition composed of organic diffusible acids which produce a hypersecretion.

5. In uræmia, toxins ordinarily given through the kidneys may find their way to the duodenum and injure the mucosa.

6. In toxæmia, infectious diseases may cause inflammatory action in the lymphoid follicles of the stomach and intestinal walls.

7. In thrombosis, functional necrosis of the intestinal epithelium due to terminal anæmia from a normal thrombosis of the umbilical vein and its ramifications.

8. In hyperchlorhydria, the mucous membrane may lose its resistance to the gastric juice and become digested.

9. As regards selective localization and hæmatogenous bacterial invasion, the streptococcus has been found in a great number of ulcer cases.

C. A. BOWERS.

Vanderhoof, D.: Dilated Duodenum, with Especial Reference to Chronic Duodenal Obstruction in Visceroptosis. *J. Am. M. Ass.*, 1917, lxix, 510.

The symptoms of chronic dilatation of the duodenum are those of an infrapapillary constriction, that is, an obstruction below the entrance of the common bile-duct and the pancreatic duct into this portion of the bowel. They may be conveniently grouped as follows:

1. Persistent or recurring vomiting. In most instances the vomitus contains bile, often in considerable quantity.

2. Pain in the upper part of the abdomen, generally referred to the right hypochondrium. As a rule, this is described as an aching or dragging pain, but it may be so severe as to suggest biliary colic, or, in other instances, it simulates the pain of peptic ulcer with irregular food-relief.

3. "*Habitus enteroptoticus*," often associated with exaggerated lordosis.

4. Obstinate constipation is the rule, although this may not be a feature of the case. Occasionally the stools are colorless and relatively free from bile.

5. Vague toxic symptoms are common. Headache is frequently a prominent symptom. These

patients appear to be peculiarly sensitive and of an unstable nervous temperament. In marked cases starvation with acidosis develops and leads to a fatal termination.

The chief clinical interest in chronic dilatation of the duodenum lies in the fact that the symptoms are almost invariably misinterpreted. In one group of cases with lesser grades of obstruction no obvious cause is noted for the condition and it is, therefore, thought to be functional.

The diagnosis, except in those cases discovered at operation or necropsy, can be reached only by having the condition in mind as a clinical entity and then confirming it by a competent roentgen-ray examination.

The treatment of chronic dilatation of the duodenum may be either medical or surgical, depending on the degree of obstruction. In the simpler cases a well conducted rest-cure, with increase of weight and the deposit of fat in the various supporting tissues of the abdominal cavity, brings about an entire cure of the condition. In more obstinate cases postural treatment has been successful. By placing the patient in the knee-chest position the weight of the stomach and intestines pulls the viscera toward the anterior abdominal wall, thus tending to release the compression on the duodenum. The knee-chest position may be maintained for fifteen minutes every two hours, the patient lying on his face and abdomen in the intervals. If the vomiting stops for a few hours the more comfortable left-side position may be ordered, with the hips elevated. This treatment may be supplemented by frequent washing out of the stomach with the tube.

Some operators have succeeded in widening the duodenal slit in the mesentery. In other cases duodenojejunostomy has been effectual. Again, resection of the right half of the colon with ileocolostomy has been done with complete relief to the distressing symptoms. With few exceptions, the operation of gastro-enterostomy has signally failed in gastromesenteric ileus. More careful study of this form of chronic intestinal obstruction will probably result in the adoption of a uniform method of procedure applicable to these cases.

EDWARD L. CORNELL.

Satre, A.: History of the Different Methods of Suture of the Intestine (*Historique des divers procédés de suture pour les plaies de l'intestin*). *J. de méd. de Par.*, 1917, xxxvi, 127.

Satre gives a short sketch of the various French methods of closing intestinal wounds. He divides these methods into four classes: (1) the simple approximation of the divided parts in mass, including the methods of Keybard, Ledran, Pean, etc.; (2) closure with the interposition of a foreign body (Keybard); (3) mucoserous sutures, (Rhamdor); (4) seroserous sutures (Jobert, Lembert, etc.).

The author quotes some contemporaneous criticisms of the seroserous sutures, including that of

MacElrath of New York, and he points out that the Lembert suture has survived all criticism, because it is based on the laws of peritoneal physiology.

W. A. BRENNAN.

Frankel, L.: Primary Tuberculosis of the Intestines. *Interst. M. J.*, 1917, xxiv, 182.

Though tuberculosis of the intestines may frequently complicate pulmonary tuberculosis, it is not often found as a primary affection. As a primary lesion it is caused by the ingestion of contaminated food, such as milk or meat. The most frequent seat of tuberculous ulcers is the terminal ileum and cæcum, this probably being due to the numerous glandular appendages found in that region, to the slowing down of the movement of the chyme, and to the alkalinity of the intestinal contents. The disease is rare in the first year of life, the frequency increasing until the fourth or fifth year and then diminishing.

The lesions of intestinal tuberculosis may be classified as: (1) diffuse ulcerous tuberculosis of the intestines, (2) hyperplastic ileocæcal tuberculosis, and (3) tuberculosis of the rectum. The symptoms of the first variety are chiefly diarrhoea and abdominal pain, though the occurrence of tenderness, progressive emaciation, and some rise of temperature are suggestive. Demonstration of the tubercle bacilli in the faeces is the best evidence of the nature of the trouble, always providing the organisms do not originate from swallowed sputum.

Ileocæcal tuberculosis is most often mistaken for carcinoma, and while it has no distinguishing symptoms, the following may be of help in its recognition: (1) palpation of the thickened terminal ileum and cæcum, which have retained their original shape, (2) the diffuse, gradually diminishing end in ileocæcal tuberculosis, (3) the slow progress of the disease, (4) tubercle bacilli in the stools or a positive tuberculin reaction. These latter tests must be interpreted carefully.

Rectal tuberculosis most commonly presents as necrosis and ulceration, the latter frequently leading to periproctitic abscesses and fistula. Frequent small stools containing membranes of purulent and bloody mucus, and accompanied with pain and tenesmus, are the outstanding features.

E. K. ARMSTRONG.

Hewitt, H. W.: The Value of the Leucocyte Count in the Diagnosis and Prognosis of Acute Appendicitis, as Based on Experience in One Hundred Cases. *Ann. Surg.*, Phila., 1917, lxxvi, 143.

The author made an exhaustive study of the relationship between the leucocyte count and the diagnosis and prognosis of appendicitis. Total and differential counts were made, those made just before operation being used as a basis of study. As far as it was possible to determine, no co-existent infections were present. He divided his cases into three groups: (1) infection confined to appendix, 35 cases;

(2) appendix perforated, infection circumscribed, 45 cases; (3) appendix ruptured, generalized peritonitis, 30 cases.

Figures are presented and considered from which he draws these conclusions:

1. The absolute count, when taken alone, is of questionable value.

2. The polynuclear count alone, in the great majority of instances, is a reliable index in diagnosis.

3. The correlated absolute and polynuclear counts are of greater value than either count taken alone, especially as regards prognosis. In general, a high absolute count with a high polynuclear count e.g., absolute 35,000 polynuclear 95 per cent, means usually a good prognosis. A high absolute count, with moderately low polynuclear, e.g., absolute 30,000 polynuclear 80 per cent, means usually a good prognosis. A low absolute count with a high polynuclear count, e.g., absolute 7,000 with polynuclear 95 per cent, indicates a grave prognosis. A low absolute count with a low polynuclear count e.g., absolute 7,000 with polynuclear 65 per cent, usually means no infection, or that the acute condition is due to anatomical or mechanical causes.

4. Normal or subnormal figures do not necessarily indicate the absence of suppuration, gangrene, or their sequelæ.

5. Catarrhal cases, fulminating cases, moribund cases, and walled-off abscesses frequently do not stimulate leucocytosis.

K. L. VEHE.

Wood, W. A.: Thirty-Three Cases of Appendicitis in Children. *Med. J. Austral.*, 1917, ii, 65.

The author made a careful study of the pathology in a series of removed appendices and compared this data with the clinical history. He found no correlation, but deduced that obstruction of the appendix predisposes inflammatory lesions and that concretions are the most frequent cause of obstruction. The pulse and temperature are of little value as guides to the degree of trouble, since perforation may occur before these are much affected. A preceding enteritis may result in appendicitis. Vomiting is a very common symptom but not dependable, occurring in 20 of 30 cases. The locality of pain at the onset is deceptive in children; it may be referred to any point of the body.

The leucocyte count is of value, and frequently corresponds to the stage of inflammation, but may go down in the late stages in spite of abscess. Rigidity is not constant.

The author's cases were operated upon as soon as diagnosed and treated with the Fowler position and Murphy drip methods with uniformly good results.

K. L. VEHE.

Wiener, J.: Local Anaesthesia in Sixty Operations for Acute and Chronic Appendicitis. *N. Y. M. J.*, 1917, cvi, 360.

This is a record of 41 chronic and 19 acute cases. Of the acute cases 7 presented empyema; 8, gan-

grene; 2, large abscesses; and 2, well-marked peritonitis.

The average time of operation was twenty-two minutes. The length of time was due to the waiting for action of the anæsthetic on the separate abdominal layers and mesenterium, and also to permit more careful handling of the tissues. Little pain was experienced. Some patients who complained during the operation later admitted that the pain was slight, but that they were afraid.

Postoperative distention is usually absent. The day following operation, the author gives pituitrin one ccm., and one-half hour later a rectal irrigation or high enema. Many patients pass gas that day. Nausea and vomiting are rarely seen except in peritonitis and abscess cases. They may occur in neurotic cases. Only small amounts of opiates are needed. Several patients received only one hypodermic. The average number given was two and a quarter.

The average stay in bed was less than seven days. The chronic cases usually left the hospital two or three days later. Adhesions were present in numerous cases. Recent ones could be separated without pain. When dense, novocaine was injected.

The technique follows: Three-quarters of an hour before operation one-quarter grain of morphine is given hypodermatically, and usually repeated just before operation unless the patient is drowsy. A one per cent novocaine solution is used, to the ounce of which twenty drops of 1:1,000 solution of epinephrin are added. The muscle-splitting McBurney incision is employed. The meso-appendix is injected as well as the wall layers. There was no mortality in the sixty cases.

HENRY J. VAN DEN BERG.

Benjamin, A. E.: Membranous Pericolicitis and Irregular or Excessive Fusion of the Mesocolon and Mural Peritonitis. *St. Paul M. J.*, 1917, xix, 235.

Benjamin reports here twenty-one cases operated for various distortions and displacements of the bowel from irregularities in fusion. He defines the different fusional anomalies and points out their embryological formation. The cæcum at the third month of fetal life is located over the right kidney, and migrates to the right iliac fossa. About the fifth month, fusion takes place between its mesocolon and that of the mural peritoneum. Irregularities in fusion give rise to various malpositions of the sigmoid and cæcum from which numerous irregularly placed bands extend to neighboring structures impeding function, and causing reduction in caliber of the bowel. The appendix is frequently involved and bound down by these bands.

The following are some of the anomalous bands mentioned by the author:

1. The parieto-colic fold of Jonnesco, and considered analogous to Jackson's veil, is a band or fusion which is found along the ascending colon.

This membrane is limited by the hepatic kink above, and by the cæcum below, and may fuse with the fold of Treves.

2. Jackson's membrane has been interpreted as a more vascular thin veil-like membrane, different from the former.

3. The bloodless fold of Treves is a sheet-like serous membrane extending over the cæcum and lower part of the colon, and is an excessive fusion of the parietal peritoneum and mesocolon, on the right side.

4. The genito-mesenteric fold of Reid is a fold of the peritoneum extending from a portion of the terminal six inches of the ileum downward and inward, to the parietal peritoneum, and when shortened or overdeveloped causes obstruction at this point, a Lane's kink. The result is the shortening and thickening of the mesentery with adhesions to the other portion of the ileum or contiguous loops.

The author is convinced that these congenital defects are influenced by the condition of the bowel within, and result in an inflammatory reaction, which is nature's method of protection. The vascular, veil-like membranes are found alone or associated with an excessive fusion. The symptoms will depend upon deformity of the bowel, the amount of stasis, or actual obstruction. Pain is a characteristic symptom, and is due to gas which is "trapped" within the bowel. Constipation or an alternate diarrhoea with little or no fever, may be observed.

X-ray is an important diagnostic measure. The author says that when a barium meal is found to pass on by and through the successive coils of the intestines, after leaving the stomach in a normal period of time, without a portion being deposited for an abnormally long period in any section or loop, the patient is usually free from gastro-intestinal disease.

M. A. BERNSTEIN.

Bowman, F. B.: An Expeditious Method for the Study of Enteric Stools. *Brit. M. J.*, 1917, ii, 250.

A simple, efficient method for the examination of stools for enteric organisms and the results of 1,200 examinations are reported. Directions are given for making up the materials required, e.g., peptone water, Endo's medium and Hiss' medium. Agglutinating serums are obtained from biological laboratories.

Each specimen of fæces is given a number and a tube of peptone water the same number. A piece of fæces the size of a pea is emulsified in the peptone water then allowed to stand one-half hour before testing on Endo's medium. On these plates after twelve to twenty-four hours bacilli coli will appear as golden metallic looking colonies and streptococci as small crimson dots. Any grey lusterless colonies are suspicious. They are fished off and stab cultures made into Hiss tubes and streak cultures on superimposed agar slopes. They are incubated over night at 37° F. Tubes showing clear growth

without bubbles are set aside for agglutination test. Small loops of the homologous organism in question are mixed with dilutions of serum of from 1-20 to 1-500 on a glass slide and examined for agglutination. Each serum is tested in this way with each type of organism to learn the proper titer to use in testing unknown cultures. A proper titer once obtained, all the unknowns are tested in the same way.

Of 1,200 specimens examined from enteric convalescents, 45 were found positive for paratyphoid A, 12 positive for paratyphoid B, and 13 for typhoid bacilli. Two cases were definite carriers of paratyphoid A and from these occasionally plates showed pure cultures of this organism.

C. A. HEDBLOM.

LIVER, PANCREAS, AND SPLEEN

Parodi, A.: Rare Postoperative Complication After Operation for Hydatid Cyst of Liver (Sobre una rara complicación postoperatoria en una operada de equinococia hepática). *Cron. méd.*, Lima, 1917, xxxiv, 259.

In a patient operated upon a second time for a hydatid cyst of the liver, Parodi found that there was a gastric perforation which communicated with the exterior through the intermediary of the marsupialized cavity. The patient showed bronchopneumonia and stercoræmia. The gastric breach, probably due to a sphacelus, finally healed.

W. A. BRENNAN.

Allende, C. I., and Rosso, N. D.: Hydatid Cyst of the Liver Opening into the Pleura (Quiste hidático del hígado abierto en la pleura). *Prensa méd. argent.*, 1917, iv, 80.

The authors give a complete clinical history of a woman aged 43 years who came to their service with the diagnosis of suppurative metapneumonic pleurisy. Operation however disclosed that it was a case of a hydatid cyst of the liver which had opened into a bronchus and thence into the pleural cavity.

In this case the authors point out that all the symptoms indicated a primary right purulent pleurisy and there was nothing to suggest that it might be secondary, viz., consecutive to a subdiaphragmatic purulent collection opening into the pleural cavity. The history of the patient showed among other things that there had been purulent bloody expectoration which apparently was due to the opening of the cyst into a bronchus through the diaphragm; and as this did not permit a sufficiency of drainage for the cystic contents, they opened up a more ample channel and passed into the pleural cavity. While the opening of a hydatid cyst into a bronchus is not rare, opening into the pleural cavity is very much less frequent.

The treatment adopted in this case was costal resection, opening of the pleura, drainage of the cyst, and marsupialization. The woman recovered after a protracted postoperative course.

W. A. BRENNAN.

Brocq, P., and Auge, A.: A Case of Acute Hepatitis and Two Cases of Liver Abscess of Probable Amœbean Origin Treated by Emetine Injections Without Surgical Opening (Un cas d'hépatite aigue et deux cas d'abcès du foie d'origine amibienne probable, traités par des injections d'émétine sans ouverture chirurgicale). *Rev. de chir.*, Par., 1917, lii, 21.

The authors give the history of three successful results of treatment by emetine of liver lesions of amœbic origin.

Surgical treatment of liver abscess in itself is insufficient for a complete recovery. It is only a palliative measure which attacks the result and not the cause. To kill the amœbæ it is necessary to treat with the specific emetine. In the emetine treatment, quite voluminous abscesses can be punctured and a living abscess converted into a dead one which can be evacuated by the trocar. When surgical intervention is necessary in the case of a very great abscess, the use of emetine obtains a much more rapid cicatrization. For a complete cure it is necessary to obtain a dysenteric sterilization. For this the patient must for a long time continue under a mixed emetine-arsenical treatment.

The authors made their injections subcutaneously in the thigh; in the three cases, total doses of 44 cg., 32 cg., and 60 cg. respectively were employed. The dose was divided into daily injections of 4 to 12 cg. The high doses did not cause any phenomena of intolerance. In an earlier reported case the daily dose varied from 2 to 6 cg.

W. A. BRENNAN.

Castronuovo, G.: Pancreatic Cyst of Luetic Origin Simulating a Tumor of the Gastrohepatic Region (Cisti del pancreas d'origine luetica, simulante un tumore della regione gastro-epatica). *Policlin.*, Roma, 1917, xxiv, sez. prat., 1077.

A man of 60 years, syphilitic, showed a peritonitic syndrome with intestinal pseudo-occlusion, followed by hepatitis and perihepatitis with moderate icterus lasting six weeks before cure under a treatment of mercury and iodides. Ten months later he showed a tumor in the epigastric region which increased to the size of a foetal head at term. On operation a large cyst on the tail of the pancreas with extensive adhesions to the liver, stomach, etc., was found. More than a liter of straw-colored fluid was extracted, sterile as regards proteolytic, amylolytic, and steatolytic ferments. The patient recovered after resection of a necrosed portion of the pancreas. The tumor was a necrotic pseudocyst having fibrous walls without epithelial covering and probably of a luetic origin.

W. A. BRENNAN.

Segura, G.: Retention of Bile (Sobre retención biliar). *Semana méd.*, Buenos Aires, 1917, xxiv, 727.

Segura reports the clinical histories of 8 cases with vague symptomatology but marked icterus and in which only surgical intervention or necropsy revealed the true conditions.

Segura thinks that every case which shows icterus persisting for more than two months and in which a precise diagnosis cannot be made ought to be surgically treated. By this means benign and curable conditions may be met, where malignancy is believed to exist. It is necessary to follow this rule because prolonged bile retention provokes hepatic insufficiency and in consequence a hæmorrhagic diathesis which causes death, as in some of his cases where an operation was performed too late or operation was refrained from. And even in cases where lesions are met which are to be considered as incurable, a palliative surgical intervention, such as a gastro-enterostomy with a cystoduodenostomy, will prolong the patient's life, because a patient with an absolute biliary syndrome suffers more from the consequences than from the actual retention of bile.

The author thinks that in two of his non-operated cases with a fatal outcome the lives would have been spared by an early operation within a few months after appearance of jaundice. W. A. BRENNAN.

Deaver, J. B.: Acute Pancreatitis. *J. Am. M. Ass.*, 1917, lxi, 434.

So important and definite of late have been the evidences of metastatic systemic infection from some inconspicuous focus that it is not unlikely that we shall find certain cases of pancreatitis are due to this type of infection. The analogy of the severe and sudden onset of hæmorrhagic pancreatitis with other conditions of the sort as, for instance, hæmatogenous infection of the kidney, is at least striking. As yet, however, this method of pancreatic infection is mere speculation.

The fact, now so well established, that the resulting areas of neurosis due to lipase are connected with acute pancreatic inflammation furnishes one of the most striking and reliable diagnostic guides to the surgeon.

The action of the protein-splitting ferment, trypsin, has escaped attention until recently. It is evident that any inflammation which causes a diffusion of lipase must also carry with it the remaining ferments which are always present in the pancreatic secretions. Trypsin as a factor in the syndrome of acute pancreatitis has escaped attention because it has given no such ocular evidence of its presence in the tissues as has lipase in the areas of fat necrosis. Possibly this should be qualified by saying that the hæmorrhage which is so striking a feature of some cases is possibly due to the digestive action of the trypsin on the vessel walls.

The treatment of the different forms of acute pancreatitis will naturally vary with the type of the disease. In the ultra-acute and acute varieties immediate operation should be the rule. The prime object is early and adequate drainage. The most satisfactory approach in this stage is through an anterior incision exposing the pancreas either through the gastrocolic omentum or the

gastrohepatic ligament, depending on whether the stomach is situated high or low.

The pancreas should be freely incised in a longitudinal direction or numerous blunt punctures made in its substance, thus giving vent to the contained blood, lymph, and obstructed secretions. Both gauze and tube drainage should be laid down to the surface of the organ and conducted to the surface through an enveloping sheet of rubber dam to minimize adhesions to the stomach and intestines.

The only exceptions to the rule of immediate operation are: (1) in case of severe shock, when sufficient time should be given for recovery under the aid of active stimulation and saline infusion; (2) when the patient at the time observed is obviously improving from the effects of the disease.

In thirteen operations for acute pancreatitis, three cases resulted fatally, a mortality of 23 per cent. One of the fatal cases was of the ultra-acute variety.

The advisability of supplementing drainage of the pancreas with operations on the biliary tract if stones or inflammation be present will be determined by the condition of the patient and the experience of the surgeon. Occasionally there are cases of such severity that it is unjustifiable to do more than the prime object of the operation, which we must regard as drainage. Usually there is ample margin of safety for the experienced abdominal surgeon to open, empty, and drain the gall-bladder and common duct if necessary. Stones in the common duct should certainly be removed if the condition warrants. In a number of instances the appendix has been removed.

The important practical points in connection with the subject of acute pancreatitis are: (1) the secondary relationship of the disease to pre-existing intra-abdominal foci of infection; (2) the lethal character of the toxæmia; (3) the necessity for prompt action; and (4) the value of direct and free drainage. EDWARD L. CORNELL.

Rankin, W.: A Case of Spontaneous Rupture of the Spleen; Splenectomy. *Brit. M. J.*, 1917, ii, 211.

A British soldier of 26 years, giving a history of malaria, was taken suddenly during the night with acute abdominal pain. He had marched the day before. There was no history or evidence of trauma. During the past 3 months he had experienced discomfort in his stomach, with occasional vomiting, after hard work. When seen he complained of acute abdominal pain. There was dullness in left flank but abdomen was not rigid. He was cold, cyanotic and pulseless. On account of malaria the spleen was suspected. At operation its capsule was found torn and two pints of blood were wiped out of pelvis and left kidney fossa. The spleen which was about eight times the normal size was removed, and the convalescence was uneventful.

C. A. HEDBLÖM.

Jones, E. G.: The Surgical Physiology of the Spleen.
South. M. J., 1917, x, 665.

Attention is called to our extraordinary ignorance about the functions of the spleen, our knowledge being practically limited to the following facts: It is concerned in the elaboration of leucocytes; it destroys senescent red corpuscles; it conserves and probably sends to the liver such products of this cell destruction as may have food value; it extracts from the circulating blood and probably forwards to the liver for distribution and destruction certain toxic products of metabolism; in prenatal life it manufactures red and white cells.

One is surprised that a glandular organ so large, so generously supplied with blood, so exposing its intrinsic cells to the circulating blood as to be conspicuous in the act, so unique in its independence of general arterial pressure as exhibited in its expansion and contraction, and so related through its efferent blood stream with such important organs, (1) should not produce an essential internal secretion or be otherwise necessary to life, and (2) should be so little understood.

The progress of recent years in respect to the beneficial effect of splenectomy in splenic anæmia, hæmolytic jaundice, pernicious anæmia and other similar affections, is reviewed. Splenectomy is indicated in splenic anæmia and hæmolytic jaundice. Its value in pernicious anæmia is not established, although there is much evidence that splenectomy with repeated massive blood transfusions gives a longer period of relief than any method of treatment heretofore adopted.

All patients with splenomegaly and anæmia from any cause should be studied with the possibility in mind that they may be benefited by appropriate surgical intervention.

Smith, C. J.: The Technique of Splenectomy.
Edinb. M. J., 1917, xix, 8.

The author records his technique because he has found it universally applicable in a consecutive series of 70 operations, comprising spleens ranging in weight from $2\frac{1}{2}$ to $7\frac{1}{2}$ pounds, movable and immovably adherent, ruptured and unruptured.

The incision is made obliquely, parallel with the costal margin and in the line of the flat muscle fibers; the rectus muscle is not divided, but is retracted inward. In this way an incision up to 14 inches in length can be made with practically no subsequent impairment of the abdominal wall. The incision is described in detail.

The next step in the operation is to free the spleen. The methods of estimating the extent of adhesions and of dealing with them are described. "Gauze wiping" dissection in the proper place succeeds in 75 per cent of the cases. Where dense fibrous adhesions exist, the dissection must be conducted patiently and from all possible directions of approach. If dangerous force will be required to overcome the fusion, an attack from another direction will often so reduce the union that a clip

can be applied and the adhesion divided; this treatment will resolve all but the few exceptional and probably calcified unions. When these are met with, the splenic capsule can be incised under full observation and stripped from the pulp for the extent of the adherent patch.

The method of delivering the spleen is described; with this technique the author has not yet met a case where the spleen could not be completely delivered outside the abdomen.

The treatment of the pedicle is next taken up. Gentle gauze wiping secures crisp definition of the strictures in the pedicle. The pedicle may be as long as 10 inches or as short as 3 or 4 inches.

Section of the pedicle is made from below upward, with the spleen completely everted and the whole length of the pedicle under observation. For clamping the pedicle the only clips the author has found satisfactory are those of the Mayo-Ochsner pattern with straight blades and the "Stiles" box joint. The forceps are applied in pairs from below upward throughout the whole length of the pedicle. The spleen is removed unbled, thus avoiding soiling of the wound with blood from the spleen. The pedicle is ligatured in sections with a strand of No. 1 abdominal silk doubled; distal to these silk ligatures a suture of No. 1 catgut is applied.

The method of peritonization of the stump is described. An intestinal needle, threaded with No. 0 catgut, is passed through 5 or 6 avascular points at a distance of $1\frac{1}{2}$ to 2 inches from the stump, picking up splenic mesentery and omentum on all sides of the stump; this, when tied, acts as a purse-string stitch and sinks the raw stump.

The author's method of performing toilet of the abdomen is described.

In closing the author states that he knows of no other incision which will give anything like the same manipulative comfort and exposure adequately to deal with such complications as may arise during the operation of splenectomy of large, adherent, and very vascular spleens. P. G. SKILLERN, JR.

MISCELLANEOUS

Hughes, E. C.: Differential Diagnosis of the Acute Abdomen. *Guy's Hosp. Gaz.*, 1917, xxxi, 294.

Each symptom is considered separately as to its occurrence in the various acute abdominal lesions. The 3 initial symptoms of acute abdominal disease are severe pain in the abdomen, shock, and vomiting, and are met with in greater or less degree in any intra-abdominal catastrophe. Always examine the gums for a blue line and the reflexes for possible tabes, but also remember that an acute abdomen may accompany these. The facial expression and the color of the mucous membranes should be noted as they frequently aid in exclusion. The temperature is elevated in inflammations but not in obstruction of the bowel or simple cholelithiasis. Shock may be very slight or severe enough to cause

death. The respiratory rate varies in accordance with the severity and location of the lesion. The position of the patient should be noted to see if he is flat on the back or doubled up to any degree. Distention or rigidity may be local or general over the abdomen. Free fluid should be noted by percussion. The presence or absence of vomiting and constipation should be inquired into. Rectal and vaginal examinations may reveal nothing but are not to be omitted. The previous history should be obtained and the urine invariably examined. The obstructions and inflammations most likely to occur at various ages are considered.

CARL R. STEINKE.

Boland, F. K.: Traumatic Rupture of Viscera Without External Wound. *J. M. Ass. Ga.*, 1917, vii, 74.

Emphasis is laid upon the fact that serious damage may result to viscera as a result of trauma, even in the absence of an external wound. The kidneys, stomach, and intestines are most frequently injured; next in order, liver, bladder, and spleen. The author cites 4 cases of his own, including one of rupture of the jejunum. The patient in this case was struck in the abdomen while playing football. The main symptoms were vomiting, elevation of temperature to 101° F., pulse 118, within a few hours after the accident, some rigidity of upper abdomen, but marked absence of shock and severe pain. Twenty-eight hours after injury pulse was 112, temperature 100.5° F., leucocytes 25,000. Vomiting had occurred 5 times, the last vomitus having a fecal odor. Bowels had acted once; slight tympanites.

Operation revealed a large rent in jejunum. Suture with drainage of the abdominal cavity was followed by recovery. Leakage from the jejunum is less dangerous than from the ileum, where bacteria abound in greater numbers. Importance is laid upon early diagnosis. "Shock alone cannot be the indicator. If the abdomen becomes rigid and tender, if rigidity increases and affects whole abdominal walls, if there is repeated vomiting, exploratory incision is imperative." LISTER H. TUHOLSKE.

Beckman, E. H.: Acute Postoperative Obstruction and Paresis. *J. Lancet*, 1917, xxxvii, 535.

The author takes up the general subject of postoperative obstruction and brings out the following facts:

1. In the normal person the abdominal viscera are protected by the lymph which bathes the abdominal contents, the omentum, the peritoneum, and the abdominal wall.

2. During anaesthesia there is a paralysis of the nervous mechanism controlling the viscera, as well as the voluntary musculature.

3. The viscera are subjected to the drying and cooling effect of the air, and traumatism during operation.

4. Gas colic is primarily a result of paresis of the intestines and not of a process of fermentation. As soon as the normal peristaltic waves are interfered with there is an overdistention causing pain.

5. There has been no satisfactory method discovered for preventing postoperative adhesions. Experiments in animals have shown that adhesions between the intestines do not cause obstruction as long as there is not an angulation produced. Oils decrease adhesions. Sodium citrate has been proposed, the rationale of the method depending on its prevention of rapid coagulation until peristaltic movements prevent the formation of strong adhesions. Where raw surfaces are left after an operation they should be covered with tissues which do not easily obstruct.

Symptoms of postoperative paresis: (1) Entire absence of the severe pains that accompany a mechanical obstruction. (2) There may or may not be abdominal distention, depending on the extent of the paresis. If in the jejunum, it may be flat, with slight distention of the epigastrium. (3) Temperature is not elevated. (4) There may be a regurgitation back into the mouth, but not a true projectile vomiting, due to involvement of the stomach. (5) Pulse becomes more rapid with exhaustion of the patient. (6) Enemata and cathartics are ineffectual as to passage of flatus. (7) The same amount of material is obtained at the second washing of the stomach. Oil will be returned. This is the type of case in which pituitrin may be used to advantage. An enterostomy at the lowest point of distended intestine may save the patient; there is a report of a case.

Acute postoperative obstruction:

Most acute obstructions occur between the third and sixth day. If adhesions produce a kink in the intestine, the peristalsis may lead to an increase in the inflammation. The peristaltic waves pass the obstructing point but the contents do not, and as soon as they are strong enough they may cause the intestine below to empty itself in a large movement. One must not be deceived by this in thinking there is no obstruction present. In this type of case there is distention, vomiting, and severe pains. Cathartics should not be given in mechanical obstruction, and there should be frequent lavage of stomach.

The important question is when to re-operate. Within three or four days the wound may be reopened and the constricting band separated. If condition of the patient will allow of but little manipulation, do an enterostomy above the obstruction but as near to it as possible. C. A. BOWERS.

Cashman, B. Z.: Tuberculous Peritonitis. *Am. J. M. Sc.*, 1917, cliv, 269.

Tuberculous peritonitis is a condition that occurs much more frequently than is recognized, because, (1) it occurs in a latent form without symptoms and is discovered only at autopsy or during laparotomy for other conditions, and (2) its manifestations are

so varied that the diagnosis is often obscure. The history of many cases of tuberculosis of the peritoneum is that of recurrent attacks of abdominal symptoms with intervals of freedom from the symptoms. The cases that are diagnosed, therefore, are usually advanced cases. The frequent association of tuberculous peritonitis with genital tuberculosis in both sexes, pulmonary tuberculosis, tuberculous adenitis, or tuberculosis of some portion of the intestinal tract, is an aid to its diagnosis. The co-existence of involvement of another serous cavity, especially the pleural cavity, is of great importance in diagnosis. In women it is frequently associated with underdevelopment of the genital organs and sterility.

The disease occurs in three forms: the miliary, 68 per cent; the chronic adhesive, 27 per cent; the chronic ulcerative, 5 per cent. The acute type may simulate acute appendicitis or intestinal strangulation, and the temperature may reach 103 and 104° F. The subacute type with abdominal pain and tenderness, continued fever, distention, diarrhoea, and relatively low leucocyte count may be confused with typhoid fever. The author has found that the presence of palpable nodules due to conglomerate tubercles on the peritoneum of the cul-de-sac, which are readily felt on rectal examination, has been of value in diagnosis, although in these cases metastatic new-growths must be ruled out. Moderate distention, abdominal tenderness without muscle spasm, abdominal discomfort, anorexia, alternating constipation and diarrhoea, irritability of the bladder, weakness, loss of weight, and sometimes vomiting may be prominent features. The symptoms and signs due to the presence of excess of fluid may constitute the whole clinical picture.

Normal or even subnormal temperature may be present. A normal or slightly increased leucocyte count with relative lymphocytosis is usually present as in other forms of tuberculosis, and is a diagnostic aid.

The author has had some interesting experiences with the von Pirquet test, in that in several of the cases a weakly positive test became strongly positive as the patient's condition improved, especially in the rapid improvement that sometimes follows a laparotomy. He has seen several very weakly positive von Pirquet tests in tuberculous peritonitis, and in three the test was absolutely negative. The cytology and bacteriology of the fluid is not of much differential value: tubercle bacilli are seldom found in the fluid.

The prognosis of tuberculous peritonitis is good. Ochsner states that 50 per cent are cured by medical treatment alone and that 50 per cent of the remainder are cured by surgical intervention. Cases should be well for at least three years before pronounced cured. The chronic ulcerative caseating variety presents the least chance of recovery with either method of treatment.

As to the treatment today there is an effort to select those cases best suited for so-called medical treatment and those in which surgical procedures are indicated. The medical treatment is always indicated, and operation should be merely an incident in the general plan of treatment. The good effects of laparotomy come from the resultant hyperæmia from exposure of the peritoneum to the air; the best results surgically are obtained in the chronic types.

The paper concludes with statistics showing end-results and analysis of cases. P. G. SKILLERN, JR.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Hibbs, R. A.: *Tuberculosis of the Knee-Joint in the Adult in Which Operations Were Done Eliminating Motion by Producing Fusion of the Femur and Tibia.* *N. Y. M. J.*, 1917, cv, 922.

In March, 1911, Hibbs published a report of an operation which had been done on January 15, 1909, for the first time. The object of the operation was the elimination of motion in the knee-joint by producing a fusion of the femur and tibia. This was accomplished by implanting the patella into the joint after denuding it of cartilage and periosteum, making for it a bed of fresh bone in the femur and tibia following the removal of the cartilage from their articular ends. The cases in which the operation was performed at that time were those with flail-knees caused by infantile paralysis. He now reports the results of the operation in five cases of tuberculosis of the knee in the adult.

He believes it is very doubtful whether it is possible by conservative treatment to effect a cure of tuberculosis of the knee-joint in the adult. It is certainly not possible in a comparatively short period of time. Therefore, both general and orthopedic surgeons have, as a rule, considered these cases operative and have treated them by resection of the joint. The successful cases of resection have been those in which the femur and tibia have become fused. When this does not take place, the disease continues active as a rule and in many instances leads to amputation. Whatever may be said of resection, it seems probable that the good accomplished by it is due to the elimination of motion where fusion takes place, rather than to the removal of the tuberculous infection which is always difficult and rarely complete. Therefore, the important consideration in the treatment of these cases seems to be the elimination of motion. The operation has been done on five patients without any attempt to remove the diseased structures, and with as little

disturbance of the joint as possible, the single object being that of producing a fusion of the femur and tibia. In one case, the patella, though diseased, was implanted exactly as though it had been healthy bone. In three of the cases some tissue was removed for pathological examination and tubercle bacilli were found. The wounds were all closed without drainage except in one instance, in which there was a discharging sinus. A catgut drain was left in the wound.

Technique: The joint is opened by a transverse incision just below the patella. The patella ligament and capsule are divided. The patella is turned up thus exposing the joint. No attempt is made at a very extensive exploration of the joint. The patella is denuded of cartilage and periosteum. Such small areas of cartilage as are visible on the femur and tibia are removed and a space is made with a curette in the femur and tibia into which the patella is placed. The patella is placed in position with the knee flexed and then upon extension it is locked very firmly. The periosteum which had been separated with great care from the patella is now stitched to the periosteum of the tibia with ten-day chromic catgut; skin and subcutaneous tissue are closed with the same; dressing and plaster spica are applied with the knee in 15° flexion; the wound heals rapidly. The plaster spica is worn for six weeks when a short plaster is applied and weight-bearing permitted. At the end of six months there is usually perfect fusion of the femur and tibia.

In three of these cases, the activity of the disease was confirmed by a pathological examination of tissue removed from the joint, and in one the patella was diseased, so that the presence of active tuberculous disease in these cases did not prevent fusion taking place. There can be no doubt that the other two cases had been tuberculous for a long period of time and that there was extensive change in the joint from it, though no tissue was removed for pathological examination. All of his patients began to walk at the end of six weeks, taking up the ordinary activities of their lives, continuing to wear either plaster or a brace for from six months to one year.

PHILIP LEWIN.

Sexsmith, G. H.: Surgical Treatment of Joints.
J. M. Soc. N. J., 1917, xiv, 262.

Of all parts of the body the joints were the last to receive the benefits of surgical treatment. From the time of the discovery and development of asepsis, general surgery has been practiced on the soft parts of the body, including the abdominal and chest cavities, with a very great degree of success; but it was not until every other line had been developed to a high degree of efficiency that the profession turned to surgery of the bones and joints. The delay was due to two causes: First and most important was the difficulties to be surmounted and the disastrous results (coming largely from the septic conditions that followed such op-

erations) which rewarded the few early efforts made by surgeons in this line; the second cause was that the surgeons of the world seemed disposed and quite satisfied to confine themselves to developing the surgery of the soft parts of the body. But when this particular field became over-crowded there was a natural desire for new lines of activity, and soon men of high ideals and efficiency were able, with extreme care in asepsis, to make successful bone and joint surgery a possibility.

The one great plea that Lane and Murphy made in their writings was for the highest possible degree of asepsis.

The author believes that dislocations should be reduced as soon as possible after their occurrence and immobilized for ten days after which careful and judicious passive motion should be adopted.

Fracture of the bony parts entering into the formation of joints should be reduced as early as possible, and if open operation is necessary it should be performed at once. The plan generally adopted in fractures of the bones away from joints of giving nature from five to ten days to recover itself and thus lessening the liability of infection is not advisable here. Unless there is prompt action in dealing with fractures extending into the joints callus will form on the fractured articulating surfaces and interfere with the free and smooth action of the joint. In cases of tearing and stretching of the ligaments of the joints, it is found that nature will repair the injury if a proper period of immobilization is maintained. Every sprained or strained joint should be immobilized for a period of from two to four weeks, during which time nature's reparative process will be completed. This would prevent many cases of what is known as cracking or slipping knee-joints as well as "weak ankles" and the like. A sprained ankle means a bruise of the synovial membrane and cartilages, together with a tearing of the ligaments and in many cases a breaking off of small portions of the tips of the malleoli; it should be thoroughly immobilized, if we expect to get perfect results in a fractured bone.

For marked cases of metastatic inflammation of a joint Sexsmith recommends the following procedure as early as possible: (1) Buck's extension, with the use of not less than twenty to thirty pounds of weight; (2) aspiration of the fluid in the joint to relieve tension; (3) the replacing of a part of such fluid with a 2 per cent solution of formalin in glycerine. This latter treatment should be repeated every twelve hours for the first three days; after this, every third day will be found sufficient.

In conclusion he emphasizes: (1) the importance of early and decisive differential diagnosis between the tubercular and ordinary infectious conditions of the joints; (2) the two causes of destruction of the synovial membrane, that is, the presence of an excessive amount of fluid, causing pressure, and its exposure to the air. The first can be prevented by early and repeated aspiration in case of effusion of the joint, the latter by avoiding at all times the

opening of a joint for any form of drainage; (3) early, complete, and prolonged immobilization of tubercular joints in children, the time required being from one to three years; (4) greater care in the treatment of sprained joints in the way of immobilization for virtually as long as in the case of a fractured bone.

PHILIP LEWIN.

Pirondini, E.: Clinical and Anatomic-Pathological Contribution to the Study of Intrarenal Ossification (Contributo clinico e anatomico-patologico allo studio della ossificazione intrarenale). *Policlin.*, Roma, 1917, xxiv, sez. chir., 339.

In almost all the organs findings of medullary and osseous tissue have been described, in the muscles, the lymphatic glands, in the eye and in the lung, not only in the human but in the animal experiments. As regards the kidney, as early as 1880 Litten demonstrated calcification in necrotic zones produced by vascular ligation. Literature on the history of this phase of the subject is reviewed further showing that Bolaffi in 1913 described osseous medullary and osteoid tissue in the nuclei of adherent intrarenal tissue.

The author has been unable to find any report of ossification in the human lung independent of neoplastic processes in which it is known that calcification is frequent. He describes such a finding in a patient, aged 37 years, suffering from left kidney calculus confirmed by radiography and which case finally came to autopsy. The autopsy showed the right kidney transformed into a series of cavities filled with pus and calculi. The left kidney was enlarged and congested. The lower half showed a traumatic lesion. On the margins of one of the cavities in the right kidney, irregular in form and measuring about 7 mm. by 6 mm., there was noted a small sharp pointed projection. It was hard and had a cartilaginous aspect, triangular in form and measured about 5 mm. by 3 mm. Histologically this projection is a complete bone formed of periosteum, of well formed bony tissue, and osseous medulla well constituted and intermediate in character between yellow and red medullæ. Such bone essentially represents the product of a completed process and not a process in course of evolution since no osteoblasts nor traces of osteoid tissue are found.

The heterotopic bone is clearly not a tumor nor in all probability is it the product of a medullary embolus. The author considers the heterotopic bone to be either the product of embryonic osteoblastomatous inclusion, or of an inflammatory metaplasia. More probably the origin is due to inflammatory connective metaplasia. For such an origin speak the advanced renal lesions in the case, the presence in the affected kidney of other areas of connective proliferation, the strict relation of the medullary tissue with the connective and the occurrence of the bony tissue in a cavity full of pus at a point where metaplastic stimuli would be of special intensity.

W. A. BRENNAN.

Morton, D. J.: Distal Osteoporosis of the Upper Extremity. *N. Y. M. J.*, 1917, cvi, 10.

The author and his colleagues, during their service at the American Ambulance Hospital in Paris, in 1916, noted with great concern the frequency of marked decalcification following all severe injuries, especially compound infected fractures of the arm, and particularly those below the elbow. His conclusions are summarized as follows:

1. In a series of cases presenting a septic compound fracture of the bones of the forearm or of the carpal area, treated with the arm in a pendent position, a diffuse progressive decalcification involving all the bones in the distal extremity of the part and beyond the inflammatory zone was disclosed, becoming quite apparent about three weeks after the time of injury especially in the cancellous structures, the carpal bones, and ends of the long bones.

2. Changes in soft structures were associated, first appearing as a marked oedema and passive congestion of the extremity which continued as long as the wounded part remained acutely inflamed and with its subsidence showed marked retrogressive changes, atrophy, and deterioration of the various structures.

3. The process is distinctly the result of prolonged hypostasis, due to venous constriction in the wounded area and the action of gravity on the circulation of the pendent arm. The changes are produced by impairment of nourishment to the tissues of the extremity and catabolic activity stimulated by the irritation afforded by the accumulation of waste and toxic products. The nature of the disturbing factor indicates the use of the elevated position not only to overcome, but also to guard against, the presence of this condition.

F. J. GAENSLER.

FRACTURES AND DISLOCATIONS

Quain, E. P.: Fractures at the Elbow. *J. Lancet*, 1917, xxxvii, 521.

The author calls attention to the need for careful consideration of the anatomy especially as to the appearance and uniting of the ossifying centers in order that treatment may be rational. The importance of a careful history is also emphasized. In diagnosis it is important to note that crepitation may be absent but pain over the site of the fracture can always be elicited on light circumscribed pressure. Of all fractures at the elbow the transverse supracondylar fracture is the most frequent. The same violence causing such a fracture in childhood is likely to cause a posterior dislocation of the elbow in the adult. In the transverse fracture the olecranon and epicondyles preserve their normal relation.

Fixation in the acutely flexed position, with the hand in full supination against the shoulder, described by Jones and others, is recommended for

fractures of this type. In the diacondylar fracture adjustment must be made under X-ray guidance with fixation as above. In fractures of the external condyle it is very essential first to restore the carrying angle by elevation of the condyle before fixation in flexion. In more complicated T- and Y-fractures operative interference is often necessary. In fracture of the epicondyles firm bandaging and rest is usually sufficient. In fracture of the olecranon with little displacement, adhesive strapping tending to force the fragment against the shaft with the arm in full extension will answer. If the displacement is 0.5 inch or over he advises operation. The author reports 38 cases of recent fractures. He advises very early gentle massage within the first week and passive motion in ten to fifteen days. One or two movements in extension and flexion daily will suffice. The early movements should never be vigorous enough to cause pain. F. J. GAENSLER.

Lagoutte: Primary Transformation of Open Gunshot Thigh Fractures into Closed Fractures (De la transformation primitive en fractures fermées des fractures ouvertes de cuisse par blessures de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 1546.

Lagoutte reports 7 cases of open thigh fracture treated by immediate reunion after surgical mechanical cleansing of the tract of fracture. Of the cases 4 were successful and consolidation was effected in from 25 to 42 days. In the other 3 cases there was delay owing to infection already set in at the time of intervention. Fistulæ resulted, but in these 3 cases also consolidation was obtained in from 35 to 45 days.

The paper is a plea to show that the best service which can be rendered to the wounded is to leave them until recovered at the front-line hospitals in the hands of those who have given them their first care; and not to carry them at once to rear hospitals, as the transportation often results in unfortunate complications for the patient.

The discussion, however, in which Quénu, Tuffier, and Delbet joined, showed clearly that the majority of the speakers did not share this opinion as it offered too great a risk for the patient. The solution was rather to be looked for in better means of transportation and disposal of the wounded.

W. A. BRENNAN.

Dun, R. C.: Early Treatment of Compound Fracture of the Femur Caused by Gunshot Wound. *Brit. M. J.*, 1917, ii, 212.

Gunshot compound fractures of the femur are among the gravest of war injuries. Shock, hæmorrhage, and sepsis are the complications that must be dealt with in these cases. The shock may be due to the trauma and the pain associated with it. Morphine, temporary fixation, heat, and saline injections are the obvious treatments. The shock may also be caused by the handling of the incompletely fixed limb in the removal from the field.

Thomas' splint applied as early as possible and the minimum amount of handling of the patient will reduce shock from this cause.

Ligature or clamping bleeding vessels should be the method of controlling hæmorrhage rather than tourniquet. Prolonged application of the tourniquet by devitalizing the tissues increases risk of gangrene. Slow oozing from a wound should always be stopped by clamps or by direct gauze pressure.

In the early stage sepsis is combated by disinfecting the skin about the wound with picric acid in methylated spirit rather than with iodine because the picric acid solution is less irritating. Drainage tubes should not be inserted. Dressings should be changed only if soaked with blood.

At the operating station cases with hæmorrhage or in poor fixation take precedence. The patient should be lifted to the table on the stretcher and no attempt made to remove clothes until he is completely anæsthetized. A wide sterile operative field, cutting away superficial wound, exploring with finger, and then laying the wound wide open so that every damaged structure may be seen, constitute the preliminary steps to determine the nature and extent of injury and necessary treatment. During this process the leg is held elevated in extension by rope and pulleys. In some cases the question of amputation is a difficult one and should be the subject for consultation. Amputation should be performed when:

1. The main vessels are divided and collateral circulation has not been established.
2. Gas gangrene has become established in more than one group of muscles or where complete excision cannot be done.
3. Either artery or vein has been ligated and there is evidence of even a localized patch of gas gangrene beyond.
4. Virulent sepsis is present and the patient is low.

In case of bad general condition from hæmorrhage one should be inclined to amputation. Involvement of knee or hip joint does not by any means necessarily call for amputation. Amputation should be done by circular or modified circular method. In addition to removing all foreign material dead tissue must be removed as one would malignant tissue. Damaged joint capsule and synovial membrane must be cut away. Perfect hæmostasis is essential.

The "salt pack" is used after treatment provided the wound can be accurately packed and provided the pressure incident to it does not involve risk of gangrene. In other cases the Carrel treatment is used. The technique of fixation is described in detail.

C. A. HEDBLÖM.

Rankin, W.: A Note on the Thomas Splint for Fractures of the Femur. *Brit. M. J.*, 1917, ii, 248.

Nearly every fractured femur comes to the base hospital in a Thomas splint. This universal

adoption is its greatest testimonial. But too little care is taken in its application. In every instance coming under the author's observation, the fixation has been so faulty that the splint had to be completely readjusted. Badly fitting splints, wrong material for slings, and poor extension improperly fixed, tend to bring a first-class and extremely simple and good method into disrepute. A technique is described embodying the following points:

The sling must be of suitable size and made of calico, linen, or strong flannel. Gauze, gauze bandage, and perforated zinc are unsatisfactory. The ring must not be too much padded; this presses on urethra and also makes use of bedpan difficult. All brands of adhesive strapping have proved unsatisfactory. A double layer of white gauze singly bandaged around limb which has been previously well smeared with Sinclair's glue is perfectly satisfactory. Where possible the extension is always carried above the knee. No skin irritation has resulted from the glue. Care must be taken to protect prominent parts. The "give" in the extension bands is corrected as necessary by approximating crossing of extension bands under sole of foot to end of splint. The foot is left unsupported allowing the patient to exercise the ankle joint.

C. A. HEDBLOM.

Thomas, J. L.: A Reconsideration of the Principles and Methods of Hugh Owen Thomas; Some Observations on Thomas' Splints and Practice. *Brit. M. J.*, 1917, ii, 175.

One of the factors which made Thomas' success so unique was the personal attention he gave to every detail in the construction of the many devices or machines which he invented. Although Thomas' name is associated with some of his own orthopedic inventions, neither English nor American authors have given him credit for evolving an epoch-making contribution of another kind to surgery. They have in addition committed the blunder of attributing to another man Thomas' method for the treatment of delayed unions of fractures and disease of joints, known as "Bier's method," but called by its originator "damming the circulation," and employed as early as 1881. Thomas had utilized his invention over a thousand times before recommending it to others, and he advised innovators to study and master his appliances before proceeding along a path in which he spent many years of experimenting before perfecting and recommending them. Many of our soldiers who have been placed on the scrap heap by medical boards are curable or can be made more useful citizens; the permanent disabilities of a still larger number could have been prevented if the principles and practice advocated by Thomas had permeated our medical schools a generation ago. Modification of Thomas' methods have to the author's knowledge been followed by results which, from an economic and wage-earning point of view, have been unsatisfactory, not to say disastrous. The author refers to Thomas' methods

of treating: (1) fracture of the femur, (2) reducing simple backward dislocation of the ankle-joint, (3) setting a Pott's fracture, (4) reducing dislocation of the hip.

1. Treatment of fracture of the femur in any situation except in the upper third is readily carried out by Thomas' method. From an extensive personal experience with the use of screws, plates, etc., the author has come to the conclusion that Thomas' method is better, safer, easier, and speedier. Thomas maintained that extension alone could not be trusted to obtain proper alignment in a fractured femur, but that the limb should have further support either at the back, the side, or front, or a combination of them. Thomas' knee-splint was made with lateral iron rods of sufficient strength to withstand the forces acting on the limb in three directions, i. e., longitudinal, transverse, and anteroposterior. It is not generally realized what an extraordinary amount of force is often required to prevent the shortening of a femur, nor that sagging deformities of fractures of femurs can be prevented by the application of anteroposterior forces acting upon the side bars of Thomas' splints according to methods he adopted. The aluminum splinting which has been used by some surgeons is too weak and pliable to withstand the requisite forces, and must be condemned.

2. In backward dislocation of the ankle-joint Thomas' method of reduction is carried out with the patient sitting. A bandage passes around patient's leg above the ankle and hangs down in a loop, in which the surgeon places his foot. Another bandage passes in a loop behind the surgeon's neck and around patient's heel. By means of these counter pulls and by manipulation of the foot with the surgeon's hands the dislocation is reduced.

3. In setting a Pott's fracture the manner of applying the necessary force and counter force is similar to that for the reduction of dislocation of the ankle, except that the counter force attached to the surgeon's foot acts upon the inner aspect of the patient's leg, while the opposing force is applied to the outer aspect of the foot and heel.

4. In reducing dislocation of the hip the pelvis is fixed to the ground by a looped towel passing over the patient's groin and under the operator's foot. The flexed knee of the patient is drawn over the operator's thigh, who grasps the patient's leg and flexes the knee, using the leg as a lever to strain the fixed point, the groin towel. By this arrangement the operator procures much force and is able to perform his flexion, rotation, abduction and sudden extension.

The author concludes that by setting a fractured limb Thomas meant the restoration of the limb to perfect symmetry, i. e., proper alignment and length. In order to do this he employed force by means of pulley, levers and special appliances constructed for the purpose, which aggregated hundreds of pounds at the time of the setting.

V. C. HUNT.

SURGERY OF THE BONES, JOINTS, ETC.

Sudeck: The Advantages and Disadvantages of the Various Methods of Surgical Intervention in Pseudarthrosis. *Deutsche med. Wchnschr.*, 1917, xlv, No. 6.

Sudeck thinks that the results obtained from subperiosteal resection are completely satisfactory; but that in some cases where the operatory wound becomes infected in consequence of included sequestræ, a necrosis occurs in the osseous stumps which were deprived of periosteum, and thus the result becomes illusory.

In periosteal resection *in situ* the inconvenience of necrosis can be avoided by making the resection of pseudarthrosis where the periosteum is healthy. After resection the stumps are sutured, and the conditions are as favorable for recovery as in a recent fracture. The author adopted this method when other methods did not give results and always obtained a rapid and complete recovery. He considers the method the safest and most satisfactory although the shortening is greater than with the subperiosteal method.

The use of small pediculated periosteal transplants applied at the suture points has given the author satisfactory results and should be adopted when it is desired to obtain as little shortening as possible. However, the method is not so safe as the preceding. Three cases in which Sudeck used free periosteal transplants were complete failures.

The author points out that in the treatment of osseous defects by free bone-grafts this method requires conditions of absolute asepsis in the wound, which does not always occur in war wounds. Very frequently latent infective germs are found in the depths of such wounds and these can easily cause suppuration and expulsion of the transplant. If such a focus should be found, the operation should be interrupted and some other method sought which does not call for so rigorous an asepsis.

From the demonstration of a large number of cases in which one method failed and a new one was tried the author finds that failures are principally due to two causes, viz., the infection of the wound and the refusal to accept the normal result of intervention. With increased experience the author has become reconciled to accepting a considerable amount of shortening in order to avoid repeated operations, which was the procedure in his earlier cases.

W. A. BRENNAN.

Senechal, M.: Some Results Obtained by the Encircling with Wire of Bone Fragments in Crushing Fractures of the Long Bones in War (Quelques résultats obtenus par le cerclage au fil métallique des esquilles dans le traitement des éclatements des os longs par projectiles de guerre). *Progrès. méd.*, Par., 1917, p. 297.

In February, 1917, Senechal described his method of wrapping wire around the loose particles of bone in crushing fractures of the long bones after a careful toilet of the wound and a proper dis-

position of the fragments. Since July 1, 1916, he has treated 310 complicated fractures, employing the wiring method in 66 cases.

Of these, 29 were thigh fractures; 8 were subsequently amputated and 5 died. Of the others, 12 were comminutive leg fractures, in one of which amputation was necessary and recovery followed; 17 were comminutive arm fractures, of which all recovered; 8 were comminutive forearm fractures, and all recovered.

Senechal claims for his method: (1) that it preserves the length of the involved limb; (2) that the constitution of solid callus is very rapid; (3) that there is a disappearance of pseudarthrosis; (4) that the mobility of the articulation is preserved. He gives the clinical history of 8 cases in support of these claims.

W. A. BRENNAN.

Olivieri, E. M.: Surgical Treatment of Ankylosis (Tratamiento quirúrgico de las anquilosis). *Semana méd.*, Buenos Aires, 1917, xxiv, 127.

The author describes two cases of bony ankylosis of the elbow in extension. In the first he resected 2 cm. of the humerus and olecranon, cut a muscular strip at the expense of the brachialis anterior and interposed it between the resected fragments, fixing it by sutures to the triceps. Three months later the articular movements were perfect. The second case was somewhat similar, with equally good results.

The author relates a third case of radiocarpal fibrous ankylosis, the hand being immovable on the forearm in extension. A strip of the radial tendon was interposed between the radius and the carpal resected part. Mobilization of the fingers was possible but caused great pain; the patient left the hospital. Passive movements of the radiocarpal articulation in extension could be made.

W. A. BRENNAN.

Porter, J. L.: Calcaneocavus; Tendon Transplantation. *Surg. Clin. Chicago*, 1917, i, 535.

The author presented a case of calcaneocavus, the result of paralysis of the group of calf muscles following an attack of poliomyelitis many years before. The mechanics of this deformity, as well as of others following paralysis of various muscle groups, was described. The Gallie tendon fixation was preferred to the Whitman astragalectomy in this instance in order not to sacrifice additional length in a limb already shortened by disease. Emphasis is laid, in the operation, on the need for careful removal of the sheath of the tendon and scarification of the tendon so that it may adhere securely in the deep groove prepared for it in the posterior surface of the tibia. The tendo achillis is buried in the groove under tension, the heel cord being drawn taut from above while the heel itself is forced upward with a wrench. A plaster cast is worn for eight weeks, following which the patient is allowed to get about using a high heel.

F. J. GAENSLEN.

Judet: Periostic and Osteoperiostic Grafts for the Treatment of Loss of Substance of the Long Bones Consecutive to War Wounds; End-Results (*Greffes périostiques et ostéo-périostiques dans le traitement des pertes de substance des os longs consécutives aux plaies de guerre; résultats éloignés*). *Paris chir.*, 1917, ix, 193.

Three cases of war wounds on the forearm in which there was a large loss of bone were treated by Judet by periosteal or subperiosteal graft. The graft was removed from the internal face of the tibia of the patient. The evolution was aseptic in each case, and has been followed for a period of from five to six months. The conclusions reached by the author from these cases are:

1. Transplantation of periosteum alone or of periosteum including osseous islets has not resulted in new bone formation.

2. Transplantation has ended in the formation of very hard blocks probably of fibrous nature.

3. The pieces of sterilized bone or ivory used as guides for the graft or to sustain the graft in place have acted as resorbable foreign bodies and should thus have contributed to the production of fibrous tissue.

Side by side with these cases should be placed for comparison others in which there was no resorbable guide, as the application of a graft to the surface of a sterilized foreign body might have caused it to lose its osteogenetic power; but it appears to him that the abrupt interruption of the vascular circulation of the periosteum by complete detachment from its connections causes it to lose its osteogenetic power. He cannot conscientiously advise this method which he feels is doomed to failure. If the design is to repair an extensive loss of bone, periosteal or subperiosteal strips used as grafts will result in failure, and one must have recourse to a transplant of fresh bone covered with its periosteum, i.e., human living bone.

W. A. BRENNAN.

McMurray, T. P.: Use and Abuse of Bone-Grafts. *Brit. M. J.*, 1917, ii, 180.

The modern technique of bone-grafting follows that of Albee, and aims at obtaining a long solid unbroken graft consisting of periosteum, compact bone, and marrow.

In all probability the most common cause of non-union is lack of fixation of the fracture. A second cause is the presence of foreign bodies, either metal, cloth, or such pieces of tissue as muscle or fascia between the fractured ends or at the occurrence of suppuration. A third cause is loss of bone tissue. Occasionally non-union is due to some debilitating process, and at times there seems to be an idiosyncrasy on the part of the patient. A fracture can only be called ununited when it has undergone proper treatment of fixation, venous congestion, and the administration of thyroid extract for a period of three months without the occurrence of union. If non-union has occurred the question arises how long to wait after cessation of the discharge before oper-

ating. Experience has shown that if the intervening period is less than six months many of the cases operated upon will become septic, even when the wound has remained soundly healed without sepsis or infection for some time before operation, and when the strictest asepsis has been carried out at operation.

The graft should be autogenous and may be removed from the tibia or from the lower or upper fragment of fractured bone as a sliding graft; the tibial graft is preferable. The graft should consist of periosteum, compact bone, and marrow, and should be at least two inches longer than the space between the fractured ends. Removal may be accomplished by the use of a circular saw or by a chisel, although the graft is liable to split if removed with a chisel. A bed should be made for the graft in the fractured ends of the bone of sufficient width to receive the graft, so placed that it lies on either fragment for a distance of at least an inch and a half. The graft is anchored by catgut or small bone-plugs; no metal should be used since it acts as a foreign body and leads to atrophy of the bone.

Fixation of the limb should be continued for at least two months, preferably in a plaster-of-Paris cast for the whole limb. If union is not firm at the end of two months, the limb should be placed in plaster or splints and treated by fixation and venous congestion, with the administration of thyroid extract.

V. C. HUNT.

Handley, W. S.: A Method of Flapless Amputation, with Subcutaneous Division of the Bone at a Higher Level. *Brit. M. J.*, 1917, ii, 244.

The guillotine method of amputation introduced by Captain Fitzmaurice Kelly is probably one of the most valuable innovations brought forth by the war. It exposes to infection the absolute minimum of raw surface. But because of adhesion of the skin to the bony stump or because of necrosis of the end owing to a simple acute osteomyelitis extending a little up the medullary canal, in nearly all cases a secondary operation is imperative. At the secondary operation calcified granulations at the end of the stump are excised and such length of bone removed that an adequate covering of soft tissue is provided for the new bony stump. Handley re-amputates the bone at the selected level by a gigli saw passed through two punctures separated by about one-third of the circumference, on the side remote from the main artery. The bone is now freed from soft tissues by periosteum elevator and removed. The cavity is drained. In exhausted patients the operation can be done in two stages, the loose end being removed at the second.

In primary amputations the method has the advantage that the bone is divided at the first step of the operation. The length of circular cuff of soft tissue can then be precisely calculated.

Handley believes his method is applicable except in cases in which extreme rapidity is required. It

is suitable in the thigh and upper arm. In the forearm and leg, owing to the presence of two bones and the relative thinness and easy retraction of soft parts, the ordinary method is probably preferable.

C. A. HEDBLÖM.

Chapple, W. A.: Reamputation. *Brit. M. J.*, 1917, ii, 242.

Cases of urgent guillotine amputations arrive at the hospitals in Britain after an interval varying from several days to a fortnight. The skin and muscles have retracted, the bone protrudes, and the surfaces are bathed in pus. If flaps have been attempted there are in addition the hanging flaps ragged at the edge from cutting through of stitches due to suppuration. Surgeons differ widely as to the proper time for secondary operation. Some wait for healing and a clean operation which often takes months.

Chapple's practice since the beginning of the war has been to reamputate after a few days' rest to put the patient in good general condition following his journey. In the meanwhile the stump is dressed with moist antiseptics. A flap amputation is done. The soft tissues are held in apposition over the end of bone by means of the "button suture." This suture consists of silkworm tied around boat-shaped vulcanite buttons or around rubber drainage tubing. The tubing is about the diameter of a slate pencil and one to one and one-half inches long. The sutures are placed staple fashion with the tubing parallel to skin edge, one to one and one-half inches from edge of lower flap and two to two and one-half inches from edge of anterior flap. The skin edges are approximated in the ordinary way.

The importance of this technique lies in the fact that reamputation can be performed at practically any time and the flaps will be held in apposition by these "button sutures" even in the presence of profuse suppuration. The channels of these sutures may even suppurate but they do not give way and the healing and restoring processes are going on all the time. In 10 to 14 days the wounds are either quite healed or sufficiently so to do away with skin sutures and a few days later the "button sutures" also. The muscles and tendons are allowed to unite to one another or to end of bone, giving greater power of movement of stump. Since there is no retraction of soft parts to allow for, a longer and consequently more useful stump can be conserved.

C. A. HEDBLÖM.

Mosti, R.: The Suture of Non-Approximated Tendon Stumps by Mobilization of Their Osseous Insertions (Sulla sutura di tendoni a monconi non ravvicinabili per mezzo della mobilizzazione della loro inserzione ossea). *Policlin.*, Roma, 1917, xxiv, sez. chir., 332.

The author discusses the various methods of restoring the interrupted continuity of a tendon when its stumps cannot be brought together. He

reports a case in which he employed the autoplasmic method of von Bergmann, but with a new modification. Von Bergmann's method, viz., mobilization of the osseous insertion of the tendon was first used by him in a case of inveterate fracture of the patella with a notable separation of the fragments. In this procedure in order to bring the stumps together and suture them von Bergmann mobilized the inferior fragment by detachment of the tibial tuberosity and fixing it at a point higher up on the tibia. This procedure was also used for suture of the rotulian tendon when its stumps showed such a breach or loss of substance that it was impossible to reunite them by other means. The method is applicable to the tricipital brachial tendon and the Achilles tendon when their stumps are not otherwise approachable.

In Mosti's case, other methods being for various reasons inapplicable, he had recourse to the von Bergmann method; but instead of utilizing the lower stump he mobilized the superior stump by complete longitudinal section of the patella followed by the displacement and fixation lower down of its anterior half. This procedure was imposed by the special conditions of the tendon the restoration of which was not possible by any other method and especially by the exact procedure of von Bergmann for the execution of which it is essential that the lower stump should be long and well preserved. In Mosti's case the lower tendon stump was short and its condition did not permit of its tibial insertion, owing to abundant neoformation of connective tissue due to a lengthy presence of a foreign body; this would have rendered an osteotomy of the tibial tuberosity very laborious and uncertain as regards its result. For these reasons von Bergmann's method was applied to the superior stump. The operative and functional results were equal to expectations and the author feels that he can recommend its adoption in all cases in which the typical procedure of von Bergmann cannot be executed.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Delbet, P.: Osteosynthesis (Sur l'osteosynthèse). *Paris chir.*, 1917, ix, 247.

Delbet presents two cases of war fractures of the thigh treated by osteosynthesis, in which the final results were excellent. There was no wound, no fistula, no tumefaction and in one case only some arthritic stiffness about the knee. In the first case the shortening was about 2 cm., in the other about 4 cm. Since operating upon these two cases, the author has treated 10 other war fracture cases in the same way and expects equally good results. He states that no mishap and no operative or post-operative incident has occurred unfavorable to this method. Deviations and deformities have been treated which no other method would have enabled him to correct.

Delbet criticizes the method popularized by

Lucas-Championnière of treating fractures by early mobilization and massage. He thinks that even if this method has been of value in enabling a number of patients to recover the use of the fractured limb rapidly, it has produced disastrous results in a number of others, and he quotes examples. He therefore speaks strongly in order to warn young practitioners against application of a method which, although good in some circumstances, can neither be generalized nor used without discernment.

The old principle, to reduce and immobilize, still holds its entire value in the treatment of fractures. Simple maneuvers often make it possible to obtain perfect reduction in common fractures of the forearm and leg. They can be employed rightfully, especially since with radiography the exactitude of the correction can be verified. But for cases in which apparatus is unsatisfactory or insufficient there is only one reliable method, osteosynthesis. This in the first stage comprises reduction under anesthesia. It is obtained completely by traction, by clearance of the area and liberation of the soft parts, while all fibrous cords which resist must be sectioned. This means that it is necessary only to free them from their osseous insertions. Traction should be strong but progressive and not forced. When the extremities are in place, the muscular retraction overcome and the muscular tonus restored to normal, there is no further increase of traction.

Delbet calls attention to the necessity in fixing a bone by osteosynthesis of using very long plates, which by mechanical principles assure a very efficacious fixation. One other important consequence of their use is that it obviates the immediate use of a plaster cast. Delbet has not had the opportunity of testing this on the femur, but on the radius, humerus and tibia the operation is finished when the plate is put in place. The time of intervention is thus shortened and there is less risk of secondary infection. The application of a cast cannot always be avoided and at some period between the 20th and 40th day after operation it may be required. At this time there is no risk of contamination. With regard to the time of applying the plate Delbet thinks it is advantageous to execute the osteosynthesis as soon as possible after the traumatism. His view is theoretical but supported by some facts observed.

Finally Delbet expresses the opinion that osteosynthesis is an operation without danger which allows correct drainage of the fracture area, gives a rapid reduction of pain, local and general disturbances, and offers the patient the possibility of a perfect reconstitution. It more and more deserves the attention of surgeons.

W. A. BRENNAN.

Keppler, C. R.: Weak-Foot; Its Stages and Treatment. *J. M. Soc. N. J.*, 1917, xiv, 313.

The gait of civilization is generally an unnatural one because:

1. The unhampered foot is not used enough; from early childhood shoes are put on the first thing in the morning and worn until bedtime.

2. The short foot muscles are weakened by undue compression from the stocking and shoe.

3. The toes are squeezed together and irritated by narrow shoes; there is a formation of corns, callosities, and other deformities. Thus proper flexion of the foot is a painful act and is unconsciously avoided.

4. In shoes the proper balance of the foot is lost, because the heels are usually too high and too narrow.

5. By the habit of heel walking, and outward turning of the toes in standing, greatly increased strain is added to the inner side of the foot structure.

This unnatural walk is one of weakness, is short and inelastic. It may, therefore, be considered, as well as all other conditions, one of the main causes of weak-foot.

Weak-foot is essentially to be considered an affection not due to disease, but to over-strain of a mechanically distorted structure.

Weak-foot in children is generally due to constitutional weakness, to excessive weight, and to illness. In the adult female it is more common late in life on account of the changes occurring at that time, the usual increase in body-weight, and the poor vascular supply of the lower limbs following childbearing. In the adult male it usually occurs in midlife on account of the strain and wear and tear of his daily life and occupation.

The symptoms in their order of frequency are pain, awkwardness, deformity, and tenderness. The stages of weak-foot are:

1. The non-deforming painful weak-foot.

2. The deforming weak-foot without spasm.

3. The spastic deforming weak-foot, or flat-foot.

In treating weak-foot one must be guided by the extent to which the condition has progressed, by the local and general physical condition, and by the patient's mental attitude. He gives the following outline for treatment:

1. Correct shoes.

2. Correction of weakness and deformity by: (a) active exercises; (b) manipulation, i.e., manual and mechanical.

3. Massage, vibration, and hot sea-salt baths.

4. Retention of weak-foot in the correct attitude by: (a) the built-up shoe; (b) adhesive plaster strapping; (c) corrective braces. (The author prefers the Whitman plate.)

5. Operation: (a) closed; (b) open.

PHILIP LEWIN.

Gellhorn, G.: The Care of the Feet in Pregnancy. *Med. Rec.*, 1917, xcii, 326.

The author agrees with Grossman who has made a study of this subject from the orthopedic standpoint and arrives at the conclusion that all pregnant women should be instructed as to the proper care

of the feet; that prophylactic measures should be instituted regardless of the presence or absence of weak feet; that neuralgic pains in the limbs, back, and sciatic region are suggestive of weak feet; and that only by the institution of prophylactic and early active treatment is it possible to prevent severe suffering in one of the most trying periods of a woman's life.

The patient who complains of painful feet in pregnancy should not be consoled with the thought that this "inevitable discomfort" will cease with the birth of the child; but the feet should be strapped and suitable shoes should be prescribed by an orthopedist; at the same time methodical exercises tending to strengthen the plantar structures, the tibialis posticus and anticus, and such other muscles as need attention, should be instituted. The same plan of treatment should be carried out during the puerperium, thus eliminating as far as possible the avoidable and uncomfortable after-effects of gestation.

R. B. COFIELD.

Reed, E. H.: End-Results of the Various Disabilities of the Returned Soldier. *Canad. M. Ass. J.*, 1917, vii, 208.

Reed divides the disabilities into two general groups, i.e., (1) medical, and (2) surgical; and as a subdivision of the first, mental. Under the first he describes the symptoms and results of the inhalation of chlorine gas. There is a period of suffocation and prostration and in some cases gas enters the stomach as well as the lungs, with resulting necrosis of mucous membrane and the attendant lack of secretion in the severe types and hypersecretion in the milder types. The treatment is chiefly supporting and stimulating and patients are sent to convalescent homes as soon as their condition will permit. Improvement is more marked in those cases where shock is a prominent feature. At first the patients suffer from aphasia of some degree. Cyanosis and dyspnoea are always present when under excitement, and exhaustion follows the slightest exertion. Clinically, there are few physical signs except for the presence of numerous rhonchi. Tuberculosis as a sequel is noticeably absent. X-ray examination reveals slight thickening of the pleura. Increase of weight is much faster than the return of strength. At the end of nine months complete recovery has not yet taken place. The more general use of masks will greatly decrease the number of future cases.

Referring to pulmonary tuberculosis, very few men were returned during the early part of the war suffering from this disease. However, during the last eight weeks this disease constituted nearly 50 per cent of the disabling conditions seen in Military District Number 13. The reasons for this are: first, it is probable that many men had an incipient tuberculosis when they enlisted; second, constant exposure so weakens their resistance that this condition manifests itself. Pneumonia and pleurisy likewise are easily contracted.

In dealing with the mental type there are the "shell-shocked" and the insane. In the "shell-shocked" cases loss of memory is a prominent feature which improves satisfactorily under favorable conditions. The same is true of the insane except that the period of convalescence is much longer. Rheumatic conditions manifest themselves after a few weeks in the training camps. The percentage of returned men is small.

The surgical conditions constitute the major portion of the disabilities of the returned soldiers. The character of wounds changes from time to time. There are less gunshot and shrapnel wounds of the skull than six months ago due in all probability to the wearing of metal helmets. These cases do well. Practically all the wounds are infected when they fall into the hands of the medical officers in the field and practically all wounds have healed before the men reach Canada. Wounds of the face and extremities offer the largest field for reconstructive surgery. Remedial exercises are being carried out in all hospitals both in Europe and Canada. A very useful apparatus is the "wall-rack." This is a wooden frame divided into three sections and firmly bolted to the wall; it accommodates three persons. In this frame atrophied and contracted muscles are stretched and developed with very encouraging results. Six months ago Germany was returning 85 to 92 per cent of her wounded to service while England and Canada were returning from 15 to 18 per cent. In the treatment of wounds medical gymnastics are very useful, in preventing deformity from the contraction of scar tissue as well as avoiding stiffness in the joints, etc. The subject of vocational training is an important one from a practical and economic standpoint and much is being done along this line.

J. J. KURLANDER.

Lovett, R. W.: The After-Care of Infantile Paralysis. *J. Am. M. Ass.*, 1917, lxxviii, 1018.

Rest is recognized as being the best treatment during the acute stage. Meddlesome therapeutics in the way of drugs, massage, and counter-irritation have been largely abandoned. During the convalescent stage which lasts for about two years from the time when tenderness disappears, the usual treatment is to employ massage and electricity, to use braces, and to allow walking when possible. The existence of tenderness is evidence of the persistence of some degree of the acute process in the cord. The use of massage while tenderness is still present as a rule will prolong it. Active treatment should not be commenced until all tenderness has disappeared. Muscular weakness is much more common than total paralysis; the Vermont figures showed that partial paralysis is nine times as common as total paralysis. Spontaneous improvement continues at least for two years and probably longer, being more rapid in the first year. Fatigue is markedly detrimental to weakened muscles. Fatigue of a harmful nature is caused not only by

too much walking but also by excessive exercise and prolonged massage. On the whole, braces and apparatus are not desirable on a weakened leg; they favor muscular atrophy. But more undesirable than braces is the acquirement of deformity, the stretching of muscles, loosening of joints, etc. Therefore, braces should be used only where absolutely necessary.

In the diagnosis, it must be remembered that the muscles act in groups and that the paralysis of one muscle alone is very rare. Warm saline baths should be continued daily. The affected limb should be warmly protected. Attempts to prevent deformity should be continued. Prolonged recumbency is not desirable and long-continued sitting favors, of the most common contractions, flexed hips with flexed knees and dropped feet. Cases with paralysis so slight that the patient walks with slight limp are dangerous so far as muscular recovery goes, as it is very difficult to convince the parents that these children should be kept off their feet from three months to a year, which must often be done if complete recovery is expected; and these are the cases in which complete recovery is frequently obtained. Apparatus and braces should be used sooner or later if in attempted standing or walking the upright position is impossible or if in such position an abnormal attitude is assumed in the ankle, knee or spine. Deltoid weakness or paralysis should be treated by a platform splint to elevate the arm at

the level of the axilla. A sling is less effective. Abdominal weakness is a frequently overlooked and very common effect of the paralysis. It is easily treated by a supporting cloth corset. Fixed deformity should be removed by stretching, tenotomy, or fasciotomy. There are three measures to secure muscular development: (1) massage, which stimulates circulation, preserves muscular tone, and promotes the removal of waste products; in excess it is harmful; (2) electricity, which, depending for its vogue largely on tradition, has done great harm, and caused many needless cripples; (3) muscular training; in Lovett's opinion this measure is the keynote in the modern treatment of paralysis. It must be carried on with a precise knowledge and with special training. Lovett summarizes his article as follows:

1. An accurate muscular diagnosis is essential to proper treatment.
2. Active treatment should not be begun until tenderness has disappeared.
3. Fatigue is dangerous; prolonged inactivity is not advisable.
4. Braces are conservative and protective, not curative.
5. Massage, electricity, and muscular training are the measures most used to bring about improvement. Of these, the last named rests on the best physiologic and pathologic basis and must be carried out with great accuracy to be effective.

J. J. KURLANDER.

SURGERY OF THE SPINAL COLUMN AND CORD

Gibney, V. P.: Osteochondritis Deformans Juvenilis (Perthes' Disease). *Med. Rec.*, 1917, xci, 793.

The author at a meeting of the Practitioners Society of New York presented in detail a number of cases illustrating not only the symptoms but the pathologic changes in this interesting phase of lesions of the hip and demonstrated by end-results a good prognosis.

Cases were also presented illustrating points in differential diagnosis. The old terms hip disease, morbus coxarius, and tuberculous hip have always been confusing and have always meant a grave prognosis. Although Legg of Boston in 1910 first described a case of an obscure affection of the hip which gradually developed into a clinical entity, it remained for Perthes in 1913 to describe so accurately this nontuberculous disease.

From Gibney's paper one finds a typical case described as follows:

A child between the fourth and tenth year of age begins to limp and the mother immediately begins to get the history of a fall or a severe strain but in the absence of night-cries and terrors she does not consult a physician until a little adduction deformity appears. Up to this time there is very little pain; a slight trauma may induce an exacerbation, as it does in tuberculous hip, but the symptoms soon

subside, while in tuberculous hip the symptoms continue in an exaggerated form. There is as a rule no shortening, occasionally one-quarter to one-half inch. The anatomical changes are a flattening of the femoral head, spreading sometimes like a mushroom over the neck and, as the name indicates, an atrophy of the cartilages along the epiphysal line following an osteochondritis. Quite naturally the writer calls attention to the necessity of revising the statistics of hip disease that abound in surgical literature and makes a plea for diagnosis based upon a more critical study of the symptoms, the signs, and the X-ray findings.

The treatment is expectant and generally ends in one or more periods of immobilization in the short plaster-of-Paris spica. The prognosis is invariably good, i.e., a limb free from deformity, little if any shortening, and function practically perfect.

Hartwell, J. B.: One Hundred and Thirty-Three Fractures of the Spine Treated at the Massachusetts General Hospital. *Boston M. & S. J.*, 1917, clxxvii, 31.

Of 133 cases, 83 resulted from falling from a height; 25 cases resulted from being "jack-knifed" by falling weights, etc., and the balance miscella-

neous. There were 48 cases of deformity in the cervical region, one in the cervical and dorsal region, 50 in the dorsal region, one fracture in the dorsal and lumbar regions, and 33 in the lumbar regions. Of 76 fractures in the cervical region suffered by 49 patients, 62 involved the fourth, fifth and sixth vertebrae alone or in combination. These tables confirm the accepted view that there are 2 regions of the spine especially liable to suffer fracture, the mid-cervical and the dorsolumbar.

Isolated fractures of the vertebral process seem rare. Only 7 are recorded: 5 of transverse process and one each of spinous process and articular process. Process fracture in this series resulted from direct trauma, body fractures being dependent upon indirect trauma. Postmortem records showed 3 cases of fracture of the intervertebral discs all in the cervical region. In each of the cases there was a complete motor and sensory paralysis below the segment of the cord opposite the fractured disc with abolition of all reflexes, superficial and deep, and retention of urine and faeces. Fracture of the skull frequently accompanies fracture in the cervical region. Shock was noted in 24 instances. From the data presented, shock is not to be expected and its presence is indicative of additional injuries.

Severe signs of cord injury were presented in 62.6 per cent of cases; 43 per cent had total transverse lesions of the cord, incomplete destruction 19 per

cent. There were some cases which presented no neurological symptoms. A fact of great importance is that of 67 patients who had signs of cord lesions, in 66 the onset of the paralysis was immediate and in only one was it gradual. Priapism was noted in 27 cases in the patients who presented signs of complete destruction of the cord. Therefore, this is a bad prognostic sign. Pain at the site of the fracture was very infrequent, being complained of in 12 cases only. Discoloration, swelling, or contusion at the site of fracture was mentioned in 23 instances. Localized tenderness was noted in 67 instances, deformity in 51 and crepitation in 8 instances.

There were 40 patients subjected to operation, 38 to laminectomy, and 2 to an attempt to remove deformity by manipulation. Extradural and subdural hæmorrhages secondary to spinal fracture were infrequent and rarely large enough to account for compression symptoms. Taken as a whole, the results of expectant treatment equaled those obtained by the operative treatment and the results of laminectomy in this series do not justify an argument in favor of the operation but rather serve as a warning against radical surgical treatment. Laminectomy is absolutely contra-indicated in patients in shock or with additional injuries; also contra-indicated where there are no medullary symptoms, and it should not be attempted before the fourth day in those cases where it will seem to be of benefit.

J. J. KURLANDER.

SURGERY OF THE NERVOUS SYSTEM

Venable, C. S.: Wrist-Drop from Traumatic Adhesions About Nerve-Trunks; Report of Two Cases. *South. M. J.*, 1917, x, 664.

The author believes that early freeing of a nerve from adhesions, even though sufficiently dense to obstruct it, will restore its function, but he does not believe that long and complete obstruction causes permanent injury through the seat of which no impulses can be transmitted. The idea has taken hold and been handed down through failure of attempts of nerve-stretching, dissociation of fibers, and freeing adhesions which are not sufficient except in the occasional case in which the adhesions do not recur. Unfortunately in nearly every case adhesions do recur, which he believes is the cause of failure. His object was to prevent the formation of adhesions. This was accomplished by using fascia which was cross-sectioned well above and below the site of injury to the nerve and was bluntly freed from the underlying muscles that were to receive the nerve in its new bed.

The fascia is fashioned with its long axis in the direction of the nerve, and of sufficient width to cover the nerve without tension. This is done first in order that it may be perfectly dry when the nerve is transplanted. The adhesions about the nerve are then dissected away, and if still constricted the

nerve-fibers are dissociated and the whole nerve for one or two inches above and below the immediate trouble is lifted from its bed and transplanted to the new bed already prepared. The fascia-flap is laid loosely over it and fixed.

This is different from rolling a strip of fascia outward, away from the muscle, over the nerve, while it carries out the same idea of protection, but adhesions are transmitted more readily from the outer than from the inner surface of the fascia.

PHILIP LEWIN.

Vernet, S. G.: Extradural Anæsthesia; New Technique (La anestesia extradural; nueva tecnica). *Rev. de cien. méd.*, Barcelona, 1917, xliii, 354.

Vernet considers the high extradural anæsthesia as practiced by Kronig, Schlimpert and Schneider to be insecure and dangerous. In a considerable percentage of cases anæsthesia does not occur; and administration of novocaine in high doses (80 ccm.) is dangerous and has caused some deaths. Any anæsthesia which necessitates more than 40 cc. of novocaine is dangerous. Moreover, this is not a true local anæsthesia since it is necessary to administer narcotics. An anatomic study of the sacrococcygeal region has given Vernet the idea that it is possible to realize a high extradural an-

æsthesia with the exclusive employment of small doses of novocaine without the aid of narcotics.

Vernet employs an anæsthetic agent called an-estidermine which contains only 20 gr. of novocaine. The needle is introduced alternately at the right and left of the sacral hiatus but not following the median line. The triangular space comprised between the sacral hiatus and the points of injection contains the lower extremity of the meningeal apparatus. Not only is a larger number of roots anæsthetized in this than in other methods, but the anæsthetic is better distributed.

W. A. BRENNAN.

Abalos, J. B.: Total and Definite Interruption of Medullary Nerve Conduction by Gunshot Without Apparent Medullary or Dura Mater Lesion (Interrupcion total y definitiva de la conduccion nerviosa de la medula por herida de bala sin lesion aparente de la misma ni de la duramadre). *Rev. méd. d. Rosario*, 1917, vii, 255.

In two cases cited by the author there was the curious phenomenon of complete interruption of spinal cord conductivity without any lesion even of the dura mater. Both cases were the result of gunshot injuries; and both were operated upon. In the first case the laminæ of the last four dorsal vertebræ were resected and the dura mater opened and carefully explored. No lesion whatever of the spinal cord could be found. In the second case the projectile was lodged in the right laminæ of the seventh vertebra. There was absolute integrity of the spinal meninges and they were not explored. Death occurred in both cases.

W. A. BRENNAN.

Lerda, G.: The Value of Rachicentesis in the Treatment of Encephalic Traumatisms (Sul valore della rachicentesi nella terapia delle lesioni traumatiche dell'encefalo). *Gior. d. r. Accad. di med. di Torino*, 1917, lxxx, 82.

In cases of traumatic encephalic lesions with fatal complications, autopsy generally shows a recent meningitis specially localized at the base; this is more frequently evident in the proximity of Majendie's foramen or Bichat's fissure and testifies

to the route followed by infective processes from the site of the lesions to the ventricles and thence to the arachnoidal spaces. This propagation of septic processes to the ventricular cavity is the complication most to be feared in the evolution of traumatic encephalic lesions and is most frequently the cause of death. To combat it, drainage is undoubtedly the best and most rational method; but it is not always possible to overcome sepsis by drainage. The author thinks that spinal puncture is an efficacious though indirect method. By this there is effected not alone a diminution in the hydrostatic pressure which the cephalo-rachidian fluid exerts on the ventricular walls, but there is a beneficial influence on the cerebral circulation, a diminution of stasis as well as in the amount of prolapse if there is such. When there is a prolapse spinal puncture favors its spontaneous reduction, lessens its pressure against the margins of the osseous breach, and obviates strangulation and occlusion of the drainage orifice of the cavity produced by the prolapsed cerebral substance.

The author refers to the favorable results obtained from spinal puncture by many surgeons during the present war in the treatment of cranial lesions. In his own experiences he has obtained similar successful results. In many cases he has practiced it 10 to 15 times or more on alternate days, extracting successively quantities of spinal fluid varying from 20 to 40 gr. and with unhopd-for results. He thinks, however, that it is imprudent to make large withdrawals in cases of recent wounds in which most probably the ventricles are involved, and in which the spinal liquid is strongly infused with blood. Too rapid and abundant a withdrawal might easily induce fresh hæmorrhage and small repeated evacuations are better. In execution a Provatz needle, 7 to 8 cm. long, is quite sufficient; the pressure at which the fluid issues is an indication as to the amount to be extracted, but it very rarely indicates extracting more than 40 to 50 gr.

The author has practiced spinal puncture and spinal anæsthesia more than 2,500 times without a single grave complication imputable to the puncture.

W. A. BRENNAN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Bainbridge, W. S.: Biopsy and Cancer; a Review. *Med. Rec.*, 1917, xci, No. 17.

This article has in part been stimulated by the action of the Department of Health of the city of New York, which has advocated and put into effect a plan whereby physicians of the city are invited to submit specimens of tissue for microscopic examination. They urge particularly that specimens which may be cancerous be sent in so that

an early diagnosis may be made, especially those involving the lips, tongue, cervix, breast, and other easily accessible points. They say that the operation of removal is free from danger, easy of performance, the degree of pain is negligible, and the result of microscopic investigation is practically always such as to determine the diagnosis with scientific exactitude.

The author takes exception to this point of view, citing the teachings of Heidenhain, Stiles, and Watson-Cheyne. The removal of small particles of tissue is not free from danger, as in this way one

may spread the disease he is trying to eradicate. Bloodgood says: "It is my opinion that the excision of a piece for diagnosis is a dangerous procedure. In six cases which were comparatively early and favorable, we did not accomplish a cure after the most radical operation. In these cases pieces had been excised for diagnosis ten days to three weeks before operation." Leitch believes that curettage is dangerous in malignant cases, as in this way malignant cells may be imbedded in normal tissue. Mayo says: "Removal of pieces of tumor for microscopic examination should be attended by some precautions, and if possible preparation for the immediate extirpation of the growth should be made if the frozen section shows malignant disease." Cullen says: "The cutting into the growth allows such a widespread dissemination of the cancer that the subsequent operation is of no avail." Many other views of like nature are quoted from the leading authorities.

Spread of cancer may take place in many ways:

1. Exploratory incisions into cancerous growths.
2. Cutting into infected tissues during operation.
3. Rupture of infected lymphatic glands or infected lymphatic vessels.
4. Tearing or lacerating cancerous growths.
5. Roughness in manipulation.
6. Curettage.

The results of microscopic examination are not always such as to determine the diagnosis with scientific exactitude. Numerous cases are cited to show where a wrong microscopic examination has been made and other cases cited where different pathologists have submitted reports on the same specimens, varying all the way from chronic inflammatory tissue to tuberculosis, carcinoma, and sarcoma. Bloodgood has submitted over sixty borderline cases to a number of pathologists, and has found that in not a single one has there been a uniform agreement as to whether the lesion was benign or malignant.

Lockwood says: "You will remember when confronted with a young and ambiguous tumor, to assume an attitude of intelligent humility, and carefully eschew diagnostic omniscience and infallibility."

C. A. BOWERS.

Pentimalli, F.: The Earliest Stages of Development of Transplanted Sarcoma and Osteochondrosarcoma (Sui primissimi stadi di sviluppo del sarcoma e dell'osteochondrosarcoma trapiantabili). *Sperimentale*, Firenze, 1917, lxxi, 53.

The author's experiments in transplantable chicken tumors were made with Rous' transplantable sarcoma and Tyller's osteochondrosarcoma. The following conclusions were reached:

1. In the first twenty-three hours after inoculation of dry tumor material in the pectoral muscle of a chicken there arise at the point of inoculation phenomena consisting mainly in an immigration of cells of different origin; in a proliferation of these and

of elements pre-existing in the tissues; to which there is added degeneration of the muscle-fibers situated at the periphery of the inoculation point.

2. After forty-eight hours a further proliferation of the immigrant elements and of the fixed elements of the interstitial tissue of the muscle is observed, which proliferation results in the formation of typical cells which show great polymorphism and giant cells. Such phenomena occur especially at the boundary between the inoculated substance and the muscular tissue in the zone which the author calls the "zone of development" of the tumor. In this period also are observed great alteration of such muscle-fibers as are found at the periphery of the inoculated material.

3. After seventy hours there are observed, but in a greater degree, the phenomena previously referred to, and especially a brisk cellular proliferation in the zone of development. In the polymorphism of these cells the fused type now definitely prevails concerning which it may be safely said that it is not in any way related in origin to the inoculated material, but seems instead to originate from the connective tissue of which the zone of development is itself constituted and principally from the proliferation of the fixed interstitial elements of the tissue. It, moreover, seems to be admissible that there is a participation of the elements constituting the circumlying muscle-fibers in the formation of such fused cells, owing to the fact that in some muscle-fibers there are observed proliferating processes, which appear to result in the formation of fusiform cells.

4. In the fourth and fifth day from inoculation the phenomena observed are the same in type as those observed after seventy hours, but are more extensive; and the results seem to confirm an active participation of the nuclei of the muscle-fibers in the fusiform type of cellular proliferation.

5. From the experiments above related it may be held that the activity of the virus of sarcoma and of osteochondrosarcoma is manifested upon the cellular elements alone, which undergo a change owing to the inflammatory and proliferative process which follows the lesion produced by the introduction of the material in the muscle.

6. The histogenesis of these two species of transplantable tumors in chickens, studied by the method of early stages, after inoculation of dry tumor material in the pectoral muscle, shows no difference in these first stages of development, between sarcoma and osteochondrosarcoma as regards their histologic picture.

7. Control of these experiments, made by inoculating the same dry material of tumor, but inactivated by heat, in the pectoral muscle, shows that the phenomena above described may be regarded as specific after the second day of inoculation; inasmuch as in the controls reaction occurs normally, as in the case of a foreign body, not only in the first day but even in the following; while by inoculating active material, reactive proliferation,

forty-eight hours after inoculation, takes a turn toward an unique type of cell of fused form and with the biologic character of anaplastic cells.

W. A. BRENNAN.

Symmers, D.: The Metastasis of Tumors; a Study of 298 Cases of Malignant Growth Exhibited Among 5155 Autopsies at Bellevue Hospital.
Am. J. M. Sc., 1917, cliv, 225.

Slightly less than 6 per cent of all patients dying in Bellevue Hospital and coming to autopsy are subjects of malignant disease. Of 298 malignant tumors observed postmortem at Bellevue Hospital, 220, or 74 per cent, were attended by metastases. The lymph nodes, liver, pleura and lungs, bones, and adrenals were the organs most commonly metastasized, and they were involved in the order named. Epithelial tumors predominated over those of connective-tissue origin in the proportion of 8 to 1.

As far as the process of metastasis is concerned, the organs of the body are divisible into 3 groups: (1) a group made up of organs which are frequently the seat of metastasis, but in which primary growths are exceedingly rare; (2) a group composed of organs which are more or less commonly the seat of primary growths, but which are themselves rarely metastasized. For example, the lymph nodes, liver, lungs, pleura, and bone marrow give rise to malignant growths only rarely, but metastasis to these organs is common, while the stomach, breast, pancreas, prostate, etc., frequently give rise to malignant tumors, but are themselves seldom metastasized. Finally there is a third group of organs the members of which are neither the seat of frequent tumor growth nor of metastasis, namely, the spleen, heart and skeletal muscle, kidney, thyroid, etc.

1. Splenic metastases are of rare occurrence and are practically always small in both size and number. They are frequently associated with numerous metastases in other situations. From this it seems reasonable to infer that metastasis of the spleen is late in point of time and that it follows only after frequent and persistent visitation of tumor cells to the splenic sinuses. Further evidence that the spleen is antagonistic to the growth of metastatic deposit is afforded by the fact that in 3 cases of carcinomatosis and in one of melanomatosis the spleen was free from detectable sign of involvement, although, in company with every other organ in the body, it must have received an abundance of cells whose vegetative capacity was in no wise different from those delivered to and successfully inoculated in other parts. The conclusion, it seems to Symmers, is justifiable that the inimical attitude of the spleen toward the growth of metastases is dependent upon resistance inherent in the splenic cells, reinforced, perhaps, by lytic properties in the blood of the splenic sinuses. No doubt the same argument is applicable to other organs in which metastases are infrequent and small, notably, the kidneys, thyroid and muscles.

2. Metastatic involvement of muscle tissue is a rare event. A new-growth may abut directly on the muscle and destroy it as a result of pressure, but infiltration of tumor cells between muscle fibers is not common, and nodular metastasis is almost unknown. On the other hand the movement of tumor emboli along the intramuscular lymphatics is frequent enough, and their passage is probably facilitated by mechanical conditions, although there are many muscles whose activity is reduced to a minimum in cachectic subjects—in fact, conditions in them are equivalent to rest, and yet metastasis is almost unknown. Whether there is a substance produced by the muscle itself that serves as an additional obstacle to the deposition and growth of tumor cells is a question.

3. The kidney, although seldom metastasized, appears, relatively speaking, to be a favorite seat for the lodgment of metastases from sarcomata. Carcinomatous metastases in the kidney are rare and are small in size and number, seldom exceeding a few millimeters in diameter nor more than a half-dozen, and are practically always found in the cortex.

The great majority of splenic metastases are derived from tumors which are notorious for metastasizing to bone marrow—cancers of the stomach and breast, and hypernephromata—a fact which assumes additional interest when it is recalled that there is a structural resemblance between bone marrow and the splenic pulp.

Both adrenals were completely or almost completely destroyed in 65 per cent of the neoplastic lesions observed in them. In not one was pigmentation of the skin or mucous membranes observed at autopsy, nor were these or other signs of Addison's disease detected during life.

4. The suprarenal capsule, like the kidney, is a favorite site for the lodgment and growth of sarcomatous metastases, the proportion of epithelial to connective-tissue metastases being only 3 to 1.

Neoplastic invasion of the larger veins, with or without subsequent thrombosis, is uncommon, and occurred only thirteen times, or in 4 per cent. The hypernephroma shows the greatest avidity for the vessels, 7 out of 15 cases, or 46 per cent, having produced secondary lesions in the veins. Suspicion should be directed to neoplastic thrombosis of the portal vein in rapidly developing ascites, and to similar changes in the common iliac vein in cedema of the lower extremity, when the physical signs in question are otherwise inexplicable.

The so-called Krukenberg tumor is not primary in the ovary, but in the stomach, where it springs, probably, from the parietal cells of the fundus glands (Hall, Symmers). The ovarian manifestations are purely metastatic, and are apt to be bilateral.

Cancer of the stomach, occurring on the basis of regenerated epithelial tubules at the periphery of an old peptic ulcer, may be insignificant in size and yet give rise to innumerable and widespread metas-

tases, whereas the medullary cancer, which appears to spring from mature gastric tubules, is apt to attain enormous dimensions, showing, at the same time, a noticeable tendency to remain confined to the stomach. In fact, it seems probable as a general proposition that adenocarcinomata that arise on the basis of regenerated epithelial structures, such as are constantly seen around old gastric ulcers and in chronic hyperplastic gastritis, metastasize earlier and more extensively than those which spring from an apparently normal mucosa. Thus, the adenocarcinomata of the breast occurring in association with chronic productive mastitis and attended by compensatory regeneration of epithelial acini, and those cases which follow lactation hyperplasia, are among the most malignant of all known varieties of cancer of the breast. The adenocarcinomata of the gall-bladder associated with regenerative efforts on the part of the mucosa to repair lesions mechanically produced by gall-stones, are exceedingly malignant, and give rise to extensive metastases and to early involvement of contiguous structures.

Carcinoma of the prostate is practically always associated with histologic changes indicating neoplastic transformation of regenerated epithelial tubules occurring in association with chronic interstitial prostatitis, and the same is true of carcinoma arising on the basis of adenomatoid hyperplasia of liver cells in cirrhosis. On the other hand, carcinoma springing from apparently mature tubules, or in situations where cells are protected from injury, are apparently less active in the matter of producing secondary growths. The explanation, Symmers thinks, lies partly in the fact that regenerated tubules often approach the foetal type of architecture, and in them the function of growth is a prominent if not a dominant feature, whereas tumors springing from apparently mature epithelium are composed of cells not so markedly consecrated to assimilation and reproduction, such, for example, as the colloid-producing cancers of the thyroid, the milk-producing cancers of the breast, etc.

Of 28 cancers of the lower intestinal tract, 15, or 53.5 per cent, were not accompanied by infiltration of surrounding structures or by metastasis. This is in striking contrast to the high degree of malignancy shown by tumors of the stomach and upper intestine.

P. G. SKILLERN, JR.

Sewaki, H., and Tagami, Y.: Fourth Report on the Action of Urea Upon the Tetanus Toxin. *Sei-i Kwai M. J.*, Tokyo, 1917, xxxvi, 71.

In their earlier reports the authors stated that their investigations showed that urotetanic solutions had no prophylactic nor curative effects on the animal organism.

They now report a further series of ten experiments in which mice were injected with varying dosages of tetanus dry toxin, urea, and antitetanic serum. Their results as stated are:

1. The action of urotetanic solution is more or less supplemented by antitetanic serum if proper dosage is added.

2. The urotetanic solution behaves somewhat like antitetanic serum, although in a lesser degree.

3. Successive doses of urotetanic solution seem to have prevented the occurrence of tetanus.

The authors are pursuing their investigations further.

W. A. BRENNAN.

Goodman, C.: Presenile Gangrene. Thrombo-Angiitis Obliterans; Further Confirmation of Its Relation to Typhus Fever. *Med. Rec.*, 1917, xcii, 275.

While reviewing the literature of typhus fever, the author finds that presenile gangrene of the extremities is found in almost every country, but is more prevalent in those countries where typhus fever is endemic, as in Russia, Austria, Japan, Turkey, and Bulgaria. This would disprove the common misconception that the condition is one peculiar to the Jewish race.

He quotes Lochman who comments on the frequency of spontaneous gangrene of the extremities observed in typhus and attributes this frequency to "an inflammation of the intima of the arteries and subsequent thrombosis which are probably caused by the pathogenic factor of typhus."

Emil Wiener states that the most characteristic pathological evidence found at postmortem examination of typhus patients is the extreme fragility of the vessel walls.

The essayist concludes that: "It seems more than ever reasonable to conclude that the typhus virus has a predilection for the blood-vessels, especially of the extremities, that its activity is followed by an inflammation of the intima with the formation of the thrombi and frequent subsequent gangrene of the foot or leg."

LUCIAN H. LANDRY.

Meriel: Elephantiasis Oedemas After War Wounds (Les oedemes elephantiasiques des membres après les blessures de guerre). *Paris méd.*, 1917, vii, 543.

Meriel refers to a peculiar complication, a localized segmental elephantiasis oedema, in the extremities after war wounds, usually slight wounds. He has observed 11 cases of this kind. The oedema is mostly segmental, involving the hand, the foot, or some other definite region. It is sometimes hard and sometimes soft. The oedema is terminated by a band beyond which the tissues are healthy. It is accompanied by nervous disturbances of sensation and trophism in the limb. The neuritis is not the result of a nerve-lesion but is due to an oedematous infiltration.

Treatment is by constriction, encasing the limb in plaster apparatus; but often the oedema and nerve disturbance persists for a long time.

W. A. BRENNAN.

Sneyd, G. C.: Irrigation and Suction Drainage for Treatment of Certain War Wounds. *Lancet*, Lond., 1917, cxliii, 194.

The Carrel method of treatment furnishes an excellent means of irrigation in the treatment of septic wounds. In cavernous wounds where counter drainage is impossible, the author has adopted a suction apparatus, which is on the principle of the Sprengel pump, using Carrel's tubes for irrigation.

The irrigation fluid, used every two hours, is chiefly Dakin's solution, occasionally normal saline or sterile water. The wound is surrounded by vaseline-impregnated lint. The suction tube has a lateral hole one-fourth inch from its termination which lies on the bottom of the wound. A clip on the suction tube allows the wound to be filled with fluid for any length of time, forming a temporary bath. The Carrel tubes are the best means of irrigation by which the wound can be thoroughly cleansed at two-hour intervals by douching, and this frequent cleansing prevents the accumulation of pus.

Ravogli, A.: Value of Skin-Grafting in the Treatment of Burns. *Interst. M. J.*, 1917, xxiv, 753.

After discussing skin-grafting to promote healing of stagnant granulating areas following burns, and its technique, Ravogli concludes: (1) "Autoplasty is always preferable to homoplasty; (2) the surface of the wound from the burn has to be perfectly clean and aseptic; and (3) when Ollier-Thiersch grafts cannot be obtained, then small autografts with Reverdin method come to our assistance."

ALBERT EHRENFRIED.

Kanavel, A. B.: Transplantation of Fat, Fascia, and Living Tissue in Surgery; Report of Experiences in Various Conditions. *J. Mo. St. M. Ass.*, 1917, xiv, 333.

The author reports a series of cases with results in a number of different conditions:

1. Transplantation of free flaps of fascia. The largest percentage of cases in which this is of value occurs where there is living tissue on both sides of the flap. The edges should be tucked down so there is no rolling; good hæmostasis should be secured.

(a) In a case of ventral hernia, scar tissue was removed, the tissue attached to the peritoneum pushed inward. Fascia lata, lined on the inside by peritoneal tissue, was transplanted on the outside. It was intact after six months.

(b) In a case of spina bifida in a child ten days old, the dura was closed; the muscles brought together as closely as possible; a flap of fascia lata from the mother sutured over the muscles and beneath the skin.

(c) In exstrophy of the bladder a second operation was done, the defect in the abdominal wall being covered in by a flap of fascia lata.

(d) In certain cases of herniorrhaphy there is not a satisfactory attachment of the conjoined tendon

to the spines of the pubes, and after the ordinary Coley, Bassini, or Ferguson operation there is still a weak point. In this type of cases the transplantation of fascia gives good results.

(e) In dural defects fascia is used with the fat attached. The author reports two cases of traumatic epilepsy, in which there was perfect healing, but clinically the patients showed no improvement.

2. In transplantation of fat it is taught that fat is absorbed, but it evidently takes a number of years for this to be brought about. The author has seen fat persisting in cases after twelve years.

3. In a case of contracted hand after a burn the palmar fascia and all tendons were involved in the scar tissue. A flap was transplanted by the pocket method. A free flap was transplanted underneath the tendons which had been dissected out. Tendons are sometimes dissected on the back of the hand and fat placed over and under them. Then at the second or third operation the author works on the front of the hand, care being taken to preserve the nerves which go to the hand, using a magnifying glass to identify them. Fat transplants about one-fourth inch in thickness should be used, with little connective tissue. The author has reoperated upon cases and found that the surgeon has sutured the nerve to a tendon. A number of successful cases of transplants of the hand are described.

4. In transplantation of bone, the author has never had any difficulty from intramedullary bone transplants from the individual himself, nor from the transplantation of ox bone into the medulla. The evidence seems to show that bone from the same individual actually lives. He has done experimental work to see if he could close a normal foramen through which nerves came out, with the object of preventing the return of trifacial neuralgia in the human. He concludes that transplanting a plug of bone with the periosteum attached on the outside and cleaning out all connective tissue in the canal is the best method.

(a) He reports a case of trifacial neuralgia operated upon with good result.

(b) Fracture of lower end of fifth lumbar vertebra. Transplants attached to short spines and imbedded in section of sacrum, leaving a bridge outside of bone tissue. This is a mistake, as the entire transplant should be imbedded in bone, or under periosteum.

5. Transplantation of parathyroids is experimental work. Results are contradictory. There are two points of difference in highly specialized tissue, in that it does not have the vitality of the lower types of tissue, and we are asking it to take on its particular function, which perhaps the lower tissue could not do.

Tissue transplanted in connective tissue healed without suppuration in practically every case and without being lost, except in two groups of cases: carcinoma of the breast, and bony cavities after osteomyelitis.

C. A. BOWERS.

Filardi, G.: Contribution to the Study of Very Slowly Developing Phlogistic Neoformations (Contributo allo studio delle neoformazioni flogistiche a decorso lentissimo). *Policlín.*, Roma, 1917, xxiv, sez. chir., 345.

Referring to the literature Filardi mentions many cases of ligneous phlegmon, etc., which have usually been reported some time after a surgical operation. Krause expressed the opinion that such ligneous phlegmona could almost always be considered as a slowly developing phlogosis characterized by an infiltration of tissue having an exit in a local suppuration. The phenomena do not become generalized. Inflammatory tumors of very slow evolution after appendicitis have been described by Lejars and others. Phlogistic processes occurring long after hernial and other abdominal operations have frequently been reported.

Filardi has recently observed two such cases. The first case showed enormous tumefaction of the right abdominal quadrants of very hard consistency. According to the patient it began in the ileocaecal region. The second case was an encysted chronic abscess of the peritoneal cavity. From the history in the second case it was clear that the inflammatory neoproduction resulting in the chronic abscess originated after surgical intervention, as the first symptoms appeared fifteen days after an intervention for bilateral inguinal hernia. The phlogosis developed around some silk sutures buried in the tissues.

According to the author the other case was referable to inflammatory tumors following slight attacks of appendicitis.

The bacteriologic examination of the pus in both cases revealed the presence of staphylococci of low virility.

A study of the literature and of his own cases led the author to conclude that such phlogistic phenomena show only slight general and local manifestations. The phlogosis sometimes arises spontaneously without any appreciable cause, but it is often manifested in a greater or less interval after a surgical operation.

Cultural bacteriological examination makes it evident that the common suppurative agencies provoke these inflammatory tumors, but in most cases they are of a low degree of virulence.

The masses usually undergo purulent fusion.

The symptomatology of these phlogistic neoformations is such as to have misled capable surgeons to erroneously diagnose them as malignant tumors.

W. A. BRENNAN.

SERA, VACCINES, AND FERMENTS

Dean, H. R.: The Influence of Temperature on the Fixation of Complement. *J. Path. & Bacteriol.*, 1917, xxi, 193.

Dean reports a series of experiments conducted with the object of ascertaining the influence of temperature on the fixation of complement. The

reagents employed were those commonly used in complement-fixation reactions: (1) normal serum and homologous antiserum; (2) bacillary extract and homologous antiserum; (3) alcoholic organ extract and serum from a syphilitic patient.

The experiments showed that a mixture of antigen and antibody fixes more complement at 0°C. than at 37°C. Similar results were observed in the case of the Wassermann reaction. The maximum fixation is attained more rapidly at 37°C. than at 0°C, while the amount of complement fixed is much greater at 0°C. than at 37°C. Antigen and antibody present in optimal proportions are readily fixed by complement. When either is in excess the reaction is retarded.

The greater part of the precipitate formed in a mixture of serum with its homologous antiserum, under the usual experimental conditions, is shown by Chapman and Welsh to be derived from the proteids of the antiserum. Fresh complement added to a mixture of diluted antiserum and antigen produces a precipitate not formed in a mixture of antiserum and antigen alone.

The author demonstrates that a mixture of antigen, antiserum, and complement forms a precipitate at 0°C. which dissolves at 37°C. and reappears when the temperature is reduced to 0°C. The formation of an absorption compound in a mixture of antigen, antiserum and guinea-pig serum is an essential part in the complement-fixation process. 0°C. favors the formation of this compound. The reaction which involves the lysis of the cell is favored by a 37°C. temperature.

The main conclusion is that the complement is fixed in much greater amounts at 0°C. than at 37°C., as is employed in the present Wassermann technique. Little work has been done in this particular line, namely, the relation of fixing of complement to the formation of a precipitate. More experiments of a similar nature will test the correctness of Dean's theory.

G. W. HOCHREIN.

Cazin, M.: The Necessity of Increasing the Initial Dosage of Antitetanic Serum in Cases of Vast or Multiple Wounds (De la nécessité d'augmenter la dose initiale de serum antitétanique dans les cas de plaies vastes ou multiples). *Paris chir.*, 1917, ix, 244.

With regard to the very important question of preventive injections of antitetanic serum Cazin says that it is necessary to bear in mind the primordial fact that this serum is in no wise bactericidal, directly destroying neither the bacillus nor the tetanic spore, and that it is antitoxic alone. It neutralizes the poison produced by the culture of the virus, and while its action lasts, protects the organism against intoxication, but leaves to the phagocytic cells, the activity of which it excites, the task of struggling against the specific microbe developed in the wound; and leaves to the surgeon the obligation and the time of suppression of this dangerous agent.

In order, however, that the protection of the organism conferred by the serum may be complete, it is necessary that the antitoxin should be in sufficient quantity. The dose of 10 ccm. almost uniformly adopted for the initial injection, whatever the case, is insufficient in cases of extensive or multiple lesions and should be replaced by a dosage of 20 or 30 ccm.

W. A. BRENNAN.

Slack, F. H., Castleman, P., and Bailey, K. R.: A Year's Work with the Wassermann Test. *Boston M. & S. J.*, 1917, clxxvii, 180.

Since January 1, 1916, free Wassermann tests have been offered by the Boston Health Department Laboratory. During the year, 2,500 of these tests were made. Reports were classified as positive, negative, doubtful, and unsatisfactory, with an occasional report of "moderate positive."

The technique used in the test is described in detail, such as preparation and titrations of the reagents. The authors believed their percentage of doubtful results high, and therefore on July 1 repeated the tests in such cases using 4 ccm. of the patients' serum with the acetone insoluble antigen instead of 1 ccm. in order to increase the antibody content, also running a control with 4 ccm. of the serum, feeling that it was perfectly safe to report as moderately positive any case giving a strongly positive reaction with a negative control. If the reaction was negative or very weak with 4 ccm. serum and the acetone insoluble antigen it was still reported doubtful. Thus the "doubtful" were a little over 3 per cent of the total.

On the whole the authors are inclined to regard the 4 ccm. results as equally reliable, if not slightly superior in delicacy of reaction to the results obtained by the ice-box methods. E. C. ROBITSHEK.

BLOOD

Pappenheimer, A. M.: Experimental Studies upon Lymphocytes; Action of Immune Sera upon Lymphocytes and Small Thymus Cells. *J. Exp. Med.*, 1917, xxvi, 163.

In a recent paper by the author brief reference was made to the production of cytotoxic sera for lymphocytes derived from human tonsils and from the rat thymus. It is the desire of the author to report here upon further experiments which have been carried out with these sera, and which appear to bear directly upon the general problem of the specificity of cytotoxins, and upon the important question of the biological identity of the small thymus cells with the lymphocytes found in the lymphoid tissues and in the circulating blood.

The method used in these studies consisted in subjecting suspensions of thymus or tonsil cells in salt solution or Locke's fluid for a given period, to the action of whatever toxic agent was chosen, and then adding trypan blue in appropriate dilution.

The cytotoxic sera were prepared by injecting rabbits intravenously with washed suspensions of

rat thymus cells or of tonsil lymphocytes. The former could be obtained almost blood-free by exsanguinating the rat, carefully dissecting off the superficial blood-vessels from the gland, and washing the suspended cells in one or more changes of salt solution. The tonsil suspensions were usually more or less admixed with red blood-cells.

The work of previous investigators, the author states, gives the impression that it is easy to produce sera which are leucotoxic both *in vitro* and upon injection. At the same time the specificity of these leucotoxic sera for the particular type of cells used as antigens, and even for leucocytes in general, he says, has been doubtful. The methods used have made certain possible factors of error unavoidable. Even careful washing of an organ or suspension, he believes, cannot render it wholly blood free, so that it is not surprising that the sera should be moderately hæmolytic and hæmagglutinative.

Pearce has shown that the injection of very small amounts of blood is sufficient to evoke the production of immune hæmolysins. When such sera are injected the lesions, as Pearce states, may be due in part to the production of hæmagglutinative thrombi, Pappenheimer believes, although this hardly seems to him to apply to the changes in lymphoid tissue described by Flexner. On the other hand, he says, the lymphotoxic effect of hæmolytic sera may be due to the lymphocytes injected with the red cells.

Pappenheimer's experiments indicated that the lymphotoxic and agglutinative factors were to a considerable degree distinct from the hæmolytic and hæmagglutinative ones, since they could not be separated from one another by absorption, and further evidence was presented that the small thymus cells are biologically related to, if not identical with the lymphocytes derived from lymph glands.

GEORGE E. BEILEY.

Dorrance, G. M.: Indications for Blood Transfusion. *Am. J. M. Sc.*, 1917, cliv, 216.

The author sums up the indications for blood transfusion as follows:

1. Acute traumatic hæmorrhage. A blood count of 1,000,000 and hæmoglobin 20 per cent or below is an absolute indication for transfusion. It is assumed that the bleeding-point is or can be controlled.
2. Hæmorrhagic obstetrical complications. In postpartum hæmorrhage the rule as given above holds. Hæmorrhage in placenta prævia or premature detachment may or may not require transfusion, depending upon the rapidity of the obstetrician and the dependent loss of blood and associated shock. Transfusion is definitely indicated if the red count is below 1,000,000 or there is associated shock, pallor, air hunger, with greatly increased coagulation time.
3. In surgical shock without hæmorrhage transfusion is not as valuable as salt solution with adrenalin, but in shock associated with severe hæmorrhage it is of decided value.

4. Hæmorrhage from the viscera. If hæmorrhage sufficient to cause grave anæmia comes from ruptured veins, as in cirrhosis of the liver, transfusion is contra-indicated, as it will increase the hæmorrhage by raising the blood-pressure; but if the anæmia is a complication of ulcer or follows a gastro-enterostomy, transfusion should be performed and cœliotomy done at once to control the bleeding. If from a typhoid or tuberculous ulcer, transfusion may or may not be of value; here the blood should be given in small amounts frequently repeated, so as not to increase the blood-pressure.

5. In non-malignant conditions, such as fibroid, papilloma of bladder, hæmorrhoids, cases of this nature which may be bad operative risks on account of small hæmorrhages, may be made good risks by transfusion.

6. Anæmia in malignant conditions. Transfusion has practically no effect upon the course of malignancy, and is only indicated as a means of overcoming the anæmia in preparation for other treatment.

7. Anæmia in tuberculosis. In pulmonary hæmorrhage it is usually not indicated. In infectious diseases it has no specific effect upon the infection, but any anæmia present is temporarily improved.

8. Blood dyscrasiæ. In hæmophilia it will correct the anæmia, and if given in sufficient amounts will usually cause the coagulation time to approximate normal. The effect upon the coagulation time is usually only temporary. In pernicious anæmia a limited number have been cured, many have been benefited, and none should have been harmed. The transfusion is best repeated several times at approximately weekly intervals. It is of decided advantage in preparing these patients for removal of the spleen. In leukaemia transfusion is not indicated. In splenic anæmia and Banti's disease it is only of value for correcting the anæmia or as a preparatory measure for splenectomy.

9. Hæmorrhage of the newborn, melæna, etc. In most of these cases, serum or defibrinated blood is all that is necessary, but in very severe anæmia it is indicated, as it is the only treatment that will benefit. Only a moderate amount should be given, and this under low pressure, to prevent dilatation of the right heart.

10. In gas-poisoning, illuminating and otherwise, it is of limited value and should only be used after copious venous section, as it is the toxæmia and not the anæmia that is to be corrected. In poisoning from coal-tar derivatives with chocolate-colored blood it will be found that a copious bleeding followed by saline infusion will usually give results equal to transfusion.

11. In delayed coagulation time from whatever cause transfusion has the double effect of correcting the anæmia and shortening the coagulation time.

ALBERT EHRENFRIED.

BLOOD AND LYMPH VESSELS

Tuffier: Concerning Arterial Wounds (A propos des plaies des artères). *Bull. et mêm. Soc. de chir. de Par.*, 1917, xliii, 1469.

In order to diminish the chances of ischæmia or gangrene after ligatures executed in the femoral, carotid, or popliteal regions, lateral arterial sutures have been recommended whenever the form of the lesion admits of this. Tuffier shares this opinion and believes the method has many advantages.

But Tuffier desires to call attention in this regard to the advantages of ligature of the corresponding and healthy vein in all cases where there is a ligature of the large vessels of the root of the limb. The ligature of the vein and artery has been demonstrated not to increase ischæmic danger and statistics of the English army have shown that ligature of the artery alone is followed by gangrene in 40.2 per cent, whereas the simultaneous ligature of artery and vein in the same conditions give only 24.5 per cent. This difference is most marked in the case of the popliteal. Ligature of the artery alone gave, in 24 cases, 41.66 per cent of gangrene; the simultaneous ligature of artery and vein gave only 21.4 per cent.

Tuffier says that the same effects which are attributable to ligature of the popliteal, femoral, and carotid arteries are observed in cases where ligature of the artery is supposed to be benign; viz., in the humeral, axillary, etc. He has observed several cases of this kind.

W. A. BRENNAN.

Pybus, F. C.: Cases of Vascular Injury. *Edinb. M. J.*, 1917, xix, 108.

The author reports five cases of vessel injury, one due to shrapnel and four due to gunshot wound.

Case 1 was a patient, 25, hit on July 21, 1916, by shrapnel which wounded him in the right testicle, penis, and upper part of left thigh. All wounds suppurated; on August 9th, a severe secondary hæmorrhage occurred from the wound in the thigh. The artery was found perforated on its anterior and inner walls, the latter perforation leading directly into the femoral vein. Excision of a segment of both artery and vein with ligature of the ends was instrumental in saving the limb and life of the patient.

Case 2 was a gunshot wound of the lower third of left thigh. There was false aneurism; the femoral artery was exposed in Hunter's canal; the artery was ligated in two places and divided between the ligatures. Pulsation ceased and all swelling disappeared. The patient returned to his post in 45 days.

In Case 3 the patient, aged 21, had gunshot wound of elbow region; there was false aneurism in the antecubital space. Proximal ligature of the brachial artery was done, leaving the sac undisturbed; two weeks later the sac was laid open. The brachial artery was found on the wall of the sac and it was grooved for about an inch, a slit-like perforation being pres-

ent at either end of the groove. Both perforations were closed with two catgut sutures, the margins of the upper opening being very friable; on releasing the tourniquet, blood oozed from the upper opening. Bleeding could not be controlled by further suture, so the vessel was ligated above and below the damaged area and divided.

Case 4 was a patient, aged 26, with gunshot wound of elbow region; there was false aneurism in the antecubital space. The operation was 69 days after injury. A considerable quantity of clot was removed from the sac. The artery was found adherent to the median nerve and appeared as a fibrous cord for 1.5 inches of its course. To make sure this was the vessel, the brachial artery was exposed above the sac and traced into the cord. Nothing further was done to the artery and the wound was closed. Restoration of function was complete and the patient discharged a fortnight later.

In Case 5 the patient, aged 36, was wounded July 4, 1916, by fragments of shrapnel in the left wrist, left foot, and leg; he also sustained a compound fracture of the right humerus. The operation was made 72 days after injury. A large aneurism was found communicating with a hole in the posterior tibial artery. On separating the artery from the calf muscles, a second smaller sac, independent of the larger, was found in the substance of the soleus muscle, communicating by a second hole in the opposite side of the artery. The damaged part of the artery was resected and the ends ligated. Wounds healed normally and the patient was able to be up in three weeks. LUCIAN H. LANDRY.

Le Fort, R.: Arteriovenous Aneurism of the Internal Carotid and Internal Jugular Treated by Transjugular Arteriorrhaphy (Anévrisme artério-veineux de la carotide interne et de la jugulaire interne traité par l'arteriorrhaphia transjugulaire). *Bull. Acad. de méd., Par.*, 1917, lxxviii, 108.

This article concerns the case of a soldier wounded by a bullet and with an aneurism of the internal carotid and internal jugular in which a successful result was obtained by transjugular arteriorrhaphy. Le Fort thinks the prevalent opinion that this procedure is only applicable in very exceptional cases appears to be exaggerated. The employment of arteriorrhaphy apparently can be much extended if the surgeon takes the following conditions into account:

1. Except in urgent cases, wait some months before operating, because in the latter period, dissection is rendered easier by the cleavage of the planes and the secondary isolation of the vessels and their connections.

2. Make an extremely wide and methodic intervention, dissecting the whole region, stratum by stratum, and liberating all vessels and nerves of the healthy parts toward the diseased parts. The region ought to be exposed like an anatomic specimen.

3. Provisory hæmostasis should be assured by temporary ligature of the arteries above and below.

4. The principal difficulty of the operation arises especially from the condition of the vein, adherent, dilated, and friable. The venous ligatures therefore ought to be at a good distance from the site of the lesion in relatively healthy tissue. The vein sectioned between ligatures should be dissected slowly by small strokes of the bistoury, all collaterals being bound to reduce the inevitable lacerations of the vessels to a minimum. All violent manipulations should be avoided, and repair of all breaches made immediately, obviating any danger to the pneumogastric and other nerves.

5. Direct arteriorrhaphy after venous resection is very difficult; but transvenous arteriorrhaphy ought to be more easily executed since it does not need the complete dissection of that part of the vein where adherence to the artery and friability are at a maximum. This operation followed by venous padding appears to offer the maximum conditions of security. W. A. BRENNAN.

Le Fur, R.: Arteriovenous Femoral Aneurism; Extirpation with Resection of the Femoral Artery and Vein (Anévrisme artério-veineux de la femorale; extirpation avec resection d'artère et de veine femorales). *Paris chir.*, 1917, ix, 231.

In a soldier a small fragment of shell had traversed the two great femoral vessels and remained embedded in the sartorius muscle. The patient presented an arteriovenous aneurism with all the classic signs; this was treated by compression for a month without result. Le Fur then decided to operate by complete extirpation after quadruple ligature and resection of the artery and vein for a length exceeding the limits of the tumor. He resected about 10 cm. of the artery and vein. Recovery was effected without the least circulatory disturbance.

The perforation in this case was not accompanied by hæmorrhage, being in fact one of the dry vascular wounds which are now frequently observed. W. A. BRENNAN.

POISONS

Turner, W.: Tetanus and Its Antitoxin; with an Illustrative Case. *Lancet*, Lond., 1917, cxcii, 532.

The author calls attention to the interesting feature of the war's aftermath when statistical study of antitetanic, prophylactic, and curative measures are compared from various fronts.

The success of the prophylactic measure he believes generally admitted. The following typical case history is given:

A lance-corporal was wounded by shrapnel shell in the right shoulder, the wound not being dressed until the next day. On the second and third days antitetanic serum was given. On the tenth day the wounds looked unhealthy and X-ray showed metal imbedded in the wound. He was treated by hot

fomentations but there was no improvement, and on the twenty-third day tetanus appeared and six drachms of spinal fluid were withdrawn and 2,000 U. S. A. units of antitetanic serum were given intramuscularly and 30 grains of chloretone per rectum. On the twenty-fifth and twenty-seventh days similar doses were given. By the twenty-ninth day the jaws were fixed, by the thirty-sixth day they could be opened half an inch, and on the thirty-seventh day an acute phlebitis, thrombosis of the left iliac femoral vein, occurred. There was gradual improvement from the forty-fourth day, though extreme weakness, etc. The patient began taking solid food.

Result of antitetanic treatment is given as follows:

1. Complete neutralization of the poison and non-appearance of the disease.
2. Extension of the period of incubation and late appearance of the disease.
3. Limitation of area affected by the disease.
4. Diminished severity in manifestation of the disease.

The author finds no record in literature of the occurrence of thrombus with phlebitis of the iliac femoral veins as a sequel of tetanus.

H. W. MEYERDING.

Conley, A. A.: Pituitrin. *J.-Lancet*, 1917, xxxvii, 505.

Besides the use of pituitrin in the field of obstetrics the author mentions its use in intestinal paralysis or atony of postoperative cases. As an illustration of this action in cases of nephritis, pneumonia, and peritonitis, he cites two cases of nephritis. Ischuria, following abdominal, vaginal, or rectal operations, or childbirth, is aided by pituitrin. In cesarean section, Conley recommends that pituitrin be injected directly into uterine musculature just before opening the uterus. To differentiate between true and false labor pains, in supposedly beginning labor, he injects 0.5 ccm. pituitrin. In true labor the pains will soon thereafter progress; if they are false, no effect of the injection is seen. Regarding the use of this drug in labor the author cites his own conclusions. Only in postpartum hæmorrhage and in some primiparæ would he give more than 0.5 ccm. at one dose. If necessary the dose is repeated in from thirty to forty-five minutes. Contracted or deformed pelvis, rigid cervix or perinæum, presence of a scar of a former 3-degree tear, high blood-pressure, eclampsia, and malposition of the foetus are held as contra-indications for pituitrin. Weak, irregular first stage pains, readily dilatable cervix, second stage of labor, if not progressing normally (if no contra-indications), and postpartum hæmorrhage are held as indications for the use of pituitrin.

E. C. ROBITSHEK.

Howe, P. R., and Hatch, R. E.: A Study of the Micro-Organisms of Dental Caries. *J. Med. Research*, 1917, xxxvi, 481.

The authors note that while the literature upon the mycology of the mouth is voluminous, it con-

tains no work upon dental caries that meets modern bacteriological requirements. They have therefore endeavored to study the bacteriology of dental caries more thoroughly and more in detail than has been done heretofore. The 1,800 children treated weekly for defective teeth at the Forsyth Dental Infirmary for Children gave exceptional opportunity for such a study.

In order to arrive at some definite conclusions in this work they studied closely a larger number of cases than had previously been used, and to be sure that they had under investigation the proper flora they took their material for culture from cases where caries was actively progressant. Their work was confined to children, since caries is distinctly a disease of childhood. Inasmuch as pulp involvement complicated matters by introducing a different type of flora, care was used to avoid including such cases in their statistics, and in order that uniform conditions might be assured, the children selected were of approximately the same age, that is, from ten to fourteen years.

The decay was studied under three different conditions: first, because the open carious tooth cavity is exposed to every kind of bacterial contamination which added confusion to the investigation, an attempt was made to eliminate the incidental invaders. The second condition was studied for the same purpose as the first; fillings having slight antiseptic properties were placed over the carious tooth substance, but left for a much shorter period. Here they believed that the bacteria which would most readily yield to the effect of the antiseptic would also give way to the more sturdy and vigorous flora intimately associated with caries. In 37 cases, 21 had one member of the group, 9 had 2 members, 7 had 3 members. The third method of studying the carious tooth material consisted of a bacterial examination of the open carious tooth.

From their study the authors conclude that the Moro-Tissier group of micro-organisms is the constant and predominant flora of dental caries. These closely allied organisms from dental caries presented the same morphological features as did those isolated from the intestine of nurslings. Their high acid-forming properties limited the character of the flora found in carious teeth. They possessed in a greater degree than other organisms the attributes that are considered necessary for inaugurating the process of dental caries.

GEORGE E. BEILBY.

Wolbach, S. B., Sisson, W. R., and Meier, F. C.: A New Pathogenic Sporotrichum Found in a Case of Acute Arthritis of the Knee Following Injury (Sporotrichum Councilmani). *J. Med. Research*, 1917, xxxvi, 337.

Instances of infection with sporotrichum following injury are of unusual interest in America, in the consideration of the distribution of presumably free living pathogenic fungi. The study of the culture in the case presented by the authors has revealed a new variety of sporotrichum, for which

they propose the name *sporotrichum councilmani*. The clinical aspects of the case were unusual and probably peculiar to the nature of the infecting organism.

The patient, a boy of ten, entered the Peter Bent Brigham Hospital complaining of pain in his right knee. One week before admission, while playing about an ash barrel, his right knee was punctured by a nail. Two days later the knee-joint became slightly swollen and painful. His normal activities, however, were not interrupted until twelve days later, when he came to the hospital. The family and past history of the boy were entirely unimportant. The physical examination on admission showed negative findings except for marked swelling of the right knee-joint. There were two small punctate abrasions over the inner aspect of the joint caused by the nail injury. Palpation and all movements of the joint elicited excruciating pain. An examination made under general anæsthesia revealed no crepitus or restriction of movements of the joint. A sense of fluctuation was easily made out. The patient's temperature on admission was 99° F. During his stay in the hospital the temperature was intermittent in character, frequently reaching a maximum of 102° F. The pulse-rate remained about 100 per minute.

The joint was aspirated repeatedly without relief and none of the therapeutic measures used gave relief. After two months the joint became immobilized. The swelling and tenderness gradually disappeared and the patient was discharged five months after admission, free from any symptoms of an acute arthritis, but with complete fixation of the right knee-joint.

Clinical pathological findings were as follows: White blood counts, made repeatedly, ranged from 9 to 14,000. The differential count showed 77 per cent polymorphonuclear cells, 7 per cent basophiles, 5 per cent large mononuclear cells, 9 per cent small mononuclears, 2 per cent eosinophiles. The von Pirquet cutaneous skin tuberculin test was negative, as was the Wassermann reaction for syphilis. Repeated X-ray examinations showed no bony involvement. Fifty cubic centimeters of light brown, peculiarly mucoid fluid was aspirated one day after admission. Microscopic examination of the fluid showed numerous pus-cells. Cultures made on plain agar showed a profuse fungus-like growth. The medium was thought to be contaminated because of the appearance of this growth, and cultures were therefore discarded. The characteristics of the fluid recovered from various aspirations were similar in each instance to those described above. Suspicion was aroused by the repeated presence of the fungus-like growth from the aspirated fluid, and careful study of the growth was then undertaken.

From their studies and experiments the authors draw the following conclusions:

At the present time the divisions of pathogenic sporotricha into species and varieties must be

based on gross and microscopic characteristics in cultures and tissues, as fermentation and serological tests have not yet proved to be reliable.

The sporotrichum isolated by the authors is in their belief sufficiently different from other pathogenic sporotricha to warrant its placing as a separate species, for which the name *sporotrichum councilmani* is proposed.

The important distinguishing features of *sporotrichum councilmani* are: (1) its pleomorphic growth, characterized by a free aerial growth of hyphæ; (2) the abundant spore formation, large size of the spores, and absence of lateral spore clusters; and (3) the occurrence in lesions as septate branching filaments.

GEORGE E. BEILBY.

RADIOLOGY

Joy, C. W.: *Localization in Radiology*. *Med. J. Austral.*, 1917, ii, 113.

The author summarizes the conditions which must obtain for accurate localization, as follows:

1. A reference system of three planes mutually at right angles and means for measuring co-ordinates in these planes.

2. A means for orthographically projecting the shadow of the foreign body on these planes.

3. Absolute relative immobility of the parts of the system while the measurements are being made, and exact reproduction of this relation at time of removal of foreign body.

To obtain the first condition the tube-stand used must be an instrument of precision, with all its movements exactly at right angles, and with means for reading accurately the magnitude and direction of these movements. For fulfilling condition No. 2 an attachment to the tube carrier is used consisting essentially of two rings, one placed between the tube and patient, the other distal to patient. These rings allow the central ray to pass through them, and when their shadow is superimposed and contains the shadow of the foreign body within their circumference, that body must lie in a plane normal to the surface upon which the projection is made. Condition 3 is met by having a perfectly stable tube-stand, a source of energy sufficiently strong to produce very short exposures, and some sort of fixation clamp or arrangement whereby exact conditions existing at time localization is made can be produced during the operation for their removal.

To fix a distance of any foreign body from any plane of reference that may have been chosen upon the surface of the subject, the use can be made of the various triangulation methods extant.

To use the data obtained to give the greatest amount of information of which it is capable, the author recommends the use of cross-sectional anatomical diagrams, plotting the foreign body in the exact position it occupies in the body. This serves not only to localize but also shows what tissues have probably been injured in its course.

In conclusion stress is laid on the vital necessity

of having efficient scientific personnel for this work, trained in mathematical and physical spheres as well as in the proper interpretation of the data supplied by the rays. Added to the article is a complete list of an equipment needed to best serve the requirements for X-ray work in military hospitals.

ADOLPH HARTUNG.

Macartney, D.: Sarcoma and Radium. *Med. Press & Circ.*, 1917, civ, 155.

The author reports the results of his experience with four cases of sarcoma treated by radium as follows:

The first was a case of sarcoma of the left lower jaw in a child, and was apparently hopeless. The tumor was incised and a tube of radium inserted for twenty-four hours. The patient was well for two years following and showed no signs of recurrence.

The second case was a child of 12 years with round-celled sarcoma of the right side of the face. The large part of the superior maxilla and malar bones were removed February 23, 1917. On March 20 there was a rapidly growing recurrence. On April 10 radium was applied to the external surface of the tumor over three different areas for periods of six hours each. The treatment was repeated May 1 and May 31. By mid-June the tumor had disappeared, leaving only a slight thickening of the malar bone behind.

In the third case a girl aged 9 was admitted March 28, 1917, with sarcoma involving the left lower jaw from the condyles to the chin. The tumor had been present for three weeks. There was a necrotic area in the mouth and hæmorrhages had occurred. On June 8 radium was applied externally over three areas for six hours each. Three weeks later the tumor was much smaller and the necrotic area had healed. The treatment was repeated June 29. The tumor is now further diminished and harder, and the jaw is freely movable. The pathological report on this case was mixed-cell sarcoma.

The fourth case was first seen May 3, 1916, with a glandular swelling in the neck at the angle of the jaw. This was removed and pronounced lymphosarcoma. Some time later he was found cachectic, with weak and rapid circulation, and evidently dying; the glands were much enlarged and hæmorrhages were frequent. Two applications of radium resulted in marvelous improvement. The tumors are much reduced, pain and hæmorrhage have ceased, and recovery is apparently assured. The pathological change effected by radium in these cases consists in a transformation into scar tissue. A small section removed from the first case after treatment showed ordinary scar tissue. In the second case there was a thickening over the entire lower maxilla. In the fourth, although the glands first softened, they afterwards diminished in size, finally becoming a small, firm, hard mass.

G. W. GRIER.

Réchon: Radiotherapy of War Wounds (La radiothérapie des blessures de guerre). *J. de radiol.*, Par., 1917, ii, 557.

The author reports a series of 10 cicatricial nerve wounds, adhesions, etc., treated by radiotherapy. This method he thinks important in war wounds. Wounds of the nerve-trunks, adhesions, cheloidal or painful cicatrices, neuritis and even ankylosis, are amenable to this treatment. If carried out under suitable conditions it often results in recovery, and almost always great amelioration. But the treatment requires a long time, and only such patients as cannot be treated by other methods, especially surgical, should be submitted to it. There is always a sufficient number of patients in this category, and it is a duty to place at their disposal every possible means of relief or cure, no matter how long it may take. W. A. BRENNAN.

Van Zwaluwenburg, J. G.: Correlation of the Roentgenographic and Surgical Findings in Sixty-Two Operated Cases. *J. Mich. St. M. Soc.*, 1917, xvi, 370.

The author has preferred to conduct his X-ray examination of patients in complete ignorance of the clinical or laboratory findings, because, first, he fears that previous knowledge of the clinical side of the case must invariably influence the examiner, consciously or unconsciously; second, because he is either liable to confirm the clinical diagnosis, or assume an attitude of such scrupulous rectitude that he is in danger of "leaning backward;" and third, because he believes that his method must show independent conclusions; incidentally, it leaves the final judgment in the hands of the clinician, where it properly belongs.

Of 380-odd cases examined, 62 were reported to him as operated and the operative findings returned. Of these 62, several cases had to be rejected because of incomplete data, or incomplete examination, or the discovery of conditions not of the gastrointestinal tract. Thus there remained 56 cases in which comparison of surgical and X-ray findings were possible.

The article is illustrated by tables, in which the surgical diagnosis is reported by vertical columns and the X-ray findings follow the horizontal lines. Each case is given a letter or character so that its position in the table can be immediately identified and reference to the records simplified. In cases of multiple diagnosis, it was necessary to select the most important for tabulation; conditions were divided into "major" and "minor," depending upon the probable priority or relative importance of the production or symptoms. Thus, for instance, adhesions have always been assigned of minor value where the primary cause for the adhesion could be recognized with any degree of certainty.

As a result of his summary, the author is inclined to believe that we are far from any pathognomonic findings in roentgenology, and that diagnosis must

be made by careful correlation of many observations, quite as in any other diagnostic method. More significant is the fact that many signs are common to unlike conditions and if we seek a common cause, he believes that we can find none, except adhesions. If we assume that adhesions produce abnormalities of functions, it is quite as logical to assume, according to the author, that they also, in part,—and not unlikely, in large part,—produce conditions and complaints. This can explain the difficulty in recognizing conditions clinically, and it can explain changes that often occur with greater chronicity.

The author closes his article with the statement that this summary of 62 cases does not give a correct idea of the value of radiographic methods of examination. The problems are essentially complex and their various factors cannot be expressed in simple terms.

E. C. ROBITSHEK.

MILITARY SURGERY

Donati, M.: Vascular War Wounds (Ferite dei vasi sanguigni). *Polidlin.*, Roma, 1917, xxiv, sez. *prat.*, 1104.

On the basis of 48 important vascular war injuries observed Donati offers some criteria on the indications and technique of surgical intervention in such cases.

The 48 cases comprised: 17 cases of immediate external or primary hæmorrhage; 3 cases of gangrene of the limb necessitating an immediate suture; 3 cases with projectile or bone fragments in the vessel lumen; 10 cases of secondary hæmorrhage; 2 cases of occluding thrombosis; 1 of cicatricial compression of the lumen; 9 aneurismal hæmatomata; 2 arterial aneurisms; and 1 arteriovenous aneurism. The vessel walls were perforated in 2 cases; in 24 cases the wound was lateral; and in 22 cases there was total laceration or complete section. In about 40 per cent of the cases there were multiple vascular wounds complicated with fractures and nerve injuries.

The author discusses the regional distribution of the injuries and the treatment adopted. If a vascular lesion is diagnosed as a rule immediate operation is justified. This can generally be executed with advantage in the traumatized area, and in the majority of cases consists in tying the healthy tissues above and below the injured segment with or without excision of the segment.

W. A. BRENNAN.

Tourniex: Five Months of War Surgery in the Gallipoli Peninsula (Cinq mois de chirurgie de guerre sur la presqu'île Gallipoli). *Bull. et mém. Soc. de chir. de Par.*, 1917, xliii, 174.

The author reports on 470 operations carried out in 8,500 hospital cases. Among these there were 3,370 limb injuries, being 65 per cent of all wounded, 36 being upper and 29 per cent lower limb wounds. Forty-two amputations were necessary.

Of 920 head injuries, 168 were penetrating cranial wounds. Of these, 104 died almost immediately, 76 without any intervention. In all 84 trepanations were done, the operative mortality being 33 per cent.

There were 70 penetrating abdominal wounds observed. In 53 there was abstinence due to lack of suitable means of operation. All died in periods varying from 2 to 56 hours after injury. Of 17 laparotomies in 11 of which there were multiple lesions, 4 have recovered in good condition and 2 are convalescent.

W. A. BRENNAN.

Armstrong, F.: War Surgery in Serbia; Penetrating Wounds of the Abdomen. *Lancet*, Lond., 1917, cxciii, 82.

The author pleads for operation in all cases of perforated intestine due to bullet wounds. His report is based on his experience at Lady Paget's Hospital, Uskub, Serbia, during the Serbian retreat in 1915. The conditions resemble those of the South African War. Twenty-four cases are reported. Ten consecutive cases of over thirty hours' duration were explored and perforations sutured with three recoveries. It is noteworthy that none of these cases that recovered were drained. Seven consecutive cases of the same duration were treated by saline, Fowler's position, opiates, stimulation, etc.; all died. Autopsy proved that two which were moribund at admission died of hæmorrhage from large vessels (gastro-epiploic and hæmorrhoidal veins) thirty hours after injury. Three cases of probable injury to the diaphragm showed an intermittent rigidity of the recti muscles lasting for several minutes with intervals of flaccidity lasting about an hour. The sign ceased after 36 hours.

The author contends that many cases of "cures" accredited to the medical treatment have in reality probably been only wounds of the abdominal wall because it has been repeatedly demonstrated that a bullet can cross the abdomen without causing material drainage to the viscera.

C. A. HEDBLÖM.

Bowlby, A., and Wallace, C.: Development of British Military Surgery at the Front. *Brit. M. J.*, 1917, i, 705.

The authors have been among the most valuable contributors to war surgery in the past three years and their summary of present-day surgery as practiced by British army surgeons is of great interest.

In this review they touch upon the work of the surgeons in regimental hospitals, field ambulances, the very important casualty dressing stations, the special hospitals, the use of X-rays, the anæsthetics used, the value of the different antiseptics, wound infections, gas gangrene, etc., and then discuss the management of wounds of different regions, such as the head, abdomen, joints, etc.

The duties of the regimental medical officer, who shares all the dangers of the line-men, are the same as formerly, but they are more essential now since first-aid resources are much more efficacious than

formerly. His ability to select those requiring prompt attention and the saving of life and suffering thus accomplished make the presence of the regimental surgeon very necessary.

At the field ambulance there is a personnel of about three medical officers, some non-commissioned officers and orderlies. It is here that the dressings of wounds from the extreme front are examined, readjusted, or supplemented by additional dressings before transport to the rear.

The equipment of this unit has been much improved to permit urgent operations. The following exceptions are specially mentioned:

1. Smashed limbs should be removed, and the patients transported in about twenty-four hours.

2. Hæmorrhage is arrested by ligature. When this is not possible, plugging and pressure on the wound are resorted to. Patients should never be sent on to the line of communication with tourniquets applied to limbs.

3. Abdominal wounds and all severe cases requiring early treatment should be sent by special motor ambulance from the advanced dressing station. These cases should not be kept waiting for the regular convoys.

The well-hung and well-driven motor ambulances of the present day, which deliver patients in good condition in a short time, have been of the utmost value in saving the wounded from capture and in getting them rapidly to the clearing stations.

The casualty clearing station is of recent origin. It did not exist in the South African War, and in its present perfected condition at the western front it is one of the special developments of the European War. Known formerly as a "clearing hospital," and used merely to clear field ambulances, pass patients on to base hospitals, and with limited equipment consisting of a staff of 8 officers, 200 stretchers and some of the more essential supplies, it is now provided with beds for as many as 400, 500, and even as many as 1,200 men, with necessary bedding and other equipment for ward work; trained nurses, surgical instruments, splints, sterilizing apparatus, etc. Special surgeons are supplied to each of the 50 or more casualty clearing stations now in operation. There were but 8 of these units at the end of 1914.

The casualty clearing stations are located behind the line of trenches in two series. The first are lined up about eight miles away and the second about three to six miles still further back from the trenches. These stations must be located near a railway siding, on good roads connecting with the front, and they must have a good water supply. When possible they are linked in pairs and stretched behind the trenches along the entire front. Those linked in pairs receive the wounded alternately in order to lessen confusion incident to the admission of cases when important work is progressing.

Except when housed in buildings, the operating room of the hutted or tented hospital is 60 by 20 ft. which affords space for four tables.

Patients are treated and retained in the casualty clearing stations until they can be moved safely by ambulance train. Transfer is hastened when heavy fighting is going on to make room for those whose arrival is impending. For the past two years the casualty clearing station has been the chief place for treatment of wounds by operation upon the dangerously wounded men who require prompt attention, rather than the field ambulances.

Among 20,589 wounded recently received at one of the advanced casualty clearing stations, there were 4,554 surgical operations performed as follows: ligature of arteries, 277; treatment of all kinds of fractures, 1,403; treatment of joints, 247; amputations, 431; for drainage of pleura, 49; for wounds of abdomen, 106; removal of testes, 33; enucleation of eye, 43; plastic operations, 33; tracheotomy, 17; excision and clearing of wounds, 1,816. For conditions not due to gunshot wounds: appendicitis, 34; strangulated hernia, 1; cellulitis, 53; various, 13.

During heavy fighting operating work is done day and night continuously which requires relays of surgeons and nurses. Many of the staff break down after three or four weeks.

The advanced operating centers are smaller units of 40 to 50 beds placed at more favorable places nearer the fighting. They deal with urgent cases requiring prompt operation, mostly abdominal wounds.

At the beginning of the war, X-ray apparatus was not supplied at the front. When used at any point on the line of communication, it was supplied in the form of mobile X-ray vans. Now the plants are stationary and used about casualty clearing stations. X-rays are of special value in locating missiles in abdominal wounds, and in head and knee cases.

Chloroform was used at the beginning of the war, but it has since been superseded by ether. The latter was administered at first by the open method, but it is now almost exclusively used with the Shipway apparatus for the administration of warm ether vapor. The open method incurs risks of lung complications in men who suffer from catarrhs of varying degrees when exposed to the wet and cold in the trenches for at least six months in the year. A large proportion of fatal abdominal cases die of lung complications after ether and they are more prone to occur from the use of the open method.

The advantages of the Shipway apparatus may be summarized as follows: The patient is quieter, and there is little secretion of mucus and saliva; there is less nausea and vomiting; less tendency to bronchitis and pneumonia; it affords economy in transport since but one-third of the amount of ether is necessary; there is less collapse in cases of shock and hæmorrhage; it can be used with an oxygen cylinder, a valuable addition in shock.

Coming from an English source it is very interesting to read the estimate that is now placed on the use of the Dakin solution as compared with the hypertonic salt solution so persistently advocated

by Sir A. E. Wright early in the war. The authors state that the treatment of wounds has at present almost altogether given way to the hypochlorous acid method in the form of eusol or the hypochlorite of soda in the solution known as Dakin's solution. The only objection cited in the use of the latter is that it is not always practicable to use it when there are great numbers of wounded to be treated. It is, however, freely employed on ambulance trains and at the bases.

The salt pack is still considered useful at the front in large open wounds in patients who are in transit by train. It is not necessary to remove it for several days and it is specially recommended when the wounded are shipped in large numbers.

It is encouraging to hear of the abolishment of the use of pure carbolic acid to disinfect gunshot wounds as recommended by some English surgeons. Carbolic acid in solution of 1:20 and 1:40 is in common use.

Peroxide of hydrogen is favored, not so much for its antiseptic properties, as for its property of loosening adherent dressings and of preventing pain and injury to soft tissues by the possible separation of gauze or wool.

The impossibility of disinfecting a wound at the front by the use of a first-aid dressing is acknowledged and well recognized. A clean dressing is applied and kept *in situ* until a favorable opportunity for a redressing. The time for the latter is fixed as early as possible, when all the exposed and torn tissues, except in the smallest wounds, are excised. This is especially recommended in the case of tissues ingrained with dirt and portions of clothing. Free drainage is next established. Unless so treated, wounds in France and Belgium become heavily infected in two or three days.

The military surgeon of experience is always solicitous about caring for the wounded on arrival at the hospital or casualty clearing station. Nothing has greater bearing on the chances of subsequent recovery than the efforts to combat the effects of shock, bleeding, exposure to cold, and the want of sleep and food. Severe pain must also be combated, and exhaustion bordering on collapse as a result of a hazardous journey over broken roads has to be carefully treated.

Wet clothes should be removed and warmth, especially in cold weather, in the form of warm blankets should be employed. Electric bulbs beneath a cradle, or a hot-air bath may be substituted. Unless contra-indicated, when the patient can take it, hot liquid food should be administered. If the patient drops to sleep, he should not be disturbed.

Primary amputation is to be postponed one or two days, especially when it is at the thigh, to permit recovery from the shock of injury and attendant conditions. Threat of virulent infection, such as gas gangrene, may demand earlier amputation, and the time when to amputate and when not to amputate is largely learned by experience at the front.

As to the treatment of shock, the authors refer to the article by Captain Marshall in the same issue of the journal, "The Administration of Anæsthetics at the Front." In this we gather the value of warmth as one of the prime factors in treatment. Fluids are best administered by mouth or rectum — subcutaneous infusion is of little or no value. This is especially true of cases before operation. A lasting improvement is more apt to be obtained if transfusion is done at the end of the operation. Hypertonic saline is preferred to the normal salt solution, and transfusion of blood gives still better results.

Captain Marshall's article is accompanied by charts showing the rapid fall of blood-pressure an hour after amputation under ether vapor anæsthetic; still greater danger from intravenous ether; another one showing little or no effects on blood-pressure and pulse-rate when operation is conducted under gas and oxygen anæsthesia.

The recently injured are specially susceptible to further shock, which is increased by the following drugs used for anæsthesia: chloroform, ether, and morphine in large doses. These should not be used in the recently injured, especially those suffering from severe injury demanding operation.

Delay in removing a badly smashed limb is apt to end in sepsis; in such cases if the patient is desperately ill from shock and loss of blood, the limb should be removed quickly by cutting through the soft tissues at the site of fracture, then clipping away torn tissues and tying the main vessels. Conducted under gas and oxygen anæsthesia, many hopeless cases may be saved. The making of a suitable stump is left to some future time.

When the arm, forearm, or leg is smashed beyond recovery, with tissues badly soiled, amputation here high up would add to existing shock. In such a condition a "flush amputation," close above the fracture, is preferable, leaving the formation of a useful stump to be done later or when the tissues have recovered.

Not excepting Egypt and the Dardanelles, where infections are so common, France is said to be the home par excellence of gas gangrene and tetanus bacilli. The infection is most frequent in wet cold weather and when patients are thoroughly chilled after receiving their injuries. Hæmorrhage and anything that lowers the resistance of the wounded are predisposing factors.

Gaseous cellulitis and massive gas gangrene are the two forms specially observed; the first being the milder cases in which the cellular tissue around the wound was involved primarily; the second being observed in those cases in which the whole limb was rapidly affected. The first was treated by free incisions, the latter by amputation.

The onset of the disease was favored by (1) retention of extravasated blood and wound secretion; (2) interference with the circulation; (3) large masses of devitalized or partially devitalized tissue; (4) extensive comminution of long bones; (5) clothing in the wound.

To obviate retention of blood and secretions in the wound, a wet dressing made from any of the ordinary disinfectants was substituted for the dry gauze and wool dressing.

The use of tourniquets and tight bandaging was avoided as much as possible in the first-aid work because any impediment of the circulation was sure to add to the possibility of infection. In compound fractures the Thomas splint permitted fixation without undue pressure in the application of the bandage. Excision of devitalized tissue was the rule in all cases.

Nearly all wounds were infected with many varieties of anaerobes, and in many cases there was a mixed infection. The bacillus aerogenes capsulatus of Welch was the most common among the anaerobes, and it was further noticed that gas-producing microbes steadily decreased with the lapse of time, at the same time that pus-producing microbes increased in number. Clinically, gas gangrene became less likely as time elapsed after the wound was incurred.

Muscle tissue is primarily and chiefly affected. The bacteria causing gas are saprophytes leading a normal existence in decaying organic material. When they invade devitalized tissue in the living body they multiply rapidly. In the dead they invade the whole body. If pure cultures of saprophytic organism are injected subcutaneously into animals the effects may be surprisingly slight and transient as they are nearly always soon destroyed by phagocytic action. They are apt to grow and multiply rapidly, however, if the injection occurs in muscle, and especially so if some damage is caused at the site of injection.

The rapid spread of gas gangrene in living voluntary muscle depends mainly on the peculiar anatomical conformation of that tissue. At the advancing edge of the gangrenous process a limited number of muscular fibers appear to be necrosed. The dead fibers are separated from their vascular sheaths by spaces filled with fluid, next the fibers in the sheaths show coagulation, which is no doubt due to the presence of this toxic fluid, and the fluid in turn is thrown out, it is believed, by the organisms in the tissues near by. The toxic effect on the muscle fiber increases with the multiplicity of the organisms, and the latter increase as they feed on the dead-tissue which results from their toxin. When once started this process may maintain itself indefinitely.

Why does gas gangrene at times recur in an amputation stump when the operation was done apparently in normal muscle? When the amputation is performed in the upper healthy part of muscles, the lower portions of which are gangrenous, it is known that bacillus aerogenes capsulatus may be found in healthy contractile muscle far beyond the gangrenous edge, so that an amputation through apparently healthy muscle may still leave numbers in the stumps. But infection will occur at times in muscles which are normal throughout their length, as the

removal of the thigh for gangrene of the leg. The development of gangrene in such a healthy stump is explained by the fact that the bacilli have been found floating in the blood. Should this take place following amputation, the organisms may find a resting place in the muscle damaged by the amputation, and thus start the disease afresh.

As a preventive measure, the wound should be opened thoroughly, free drainage established and all dead tissue and foreign bodies removed.

As a curative measure, amputation is the only recourse when the gangrene appears in a segment of a limb where the main blood-supply has been interrupted higher up. If the gangrene occurs in the muscle groups actually wounded the treatment will depend on the condition of the patient. If good, the wound is freely opened and the diseased muscle cut away. All muscle that has lost its contractility or that shows a red-brick color should be cut away. If the general condition is bad, amputation is the safer plan. Such a limb is seldom saved if the bone is broken.

Experience in recent wars — the Spanish-American, Anglo-Boer, Russo-Japanese, and Turko-Balkan wars — had convinced the majority of surgeons that laparotomy for gunshot wounds of the abdomen in active campaign was impracticable, and that better results seemed to be obtained by pursuing a *laissez faire* policy. It was said that the small caliber bullets were apt to pass through the intestinal area, without entering the lumen of the gut, and when they did, the opening was so small that it was at once closed by the everted mucous membrane which prevented escape of fecal contents in the peritoneal cavity, thereby warding off the development of peritonitis. In these wars where the armies fought in the open, the surgeon could not command environments, and it was impossible to operate upon the wounded immediately after the receipt of injury. Scarcity of water at relief stations was added as a reason for noninterference.

The conditions which obtain in the present war are very different. The armies are fighting in a settled country, and the antagonists are distributed on a fixed fighting line.

In the earlier part of the war, in the retreat from Mons, and the Aisne, operative treatment was next to impossible because the army was constantly on the move. Later when the armies began to occupy fixed positions and when surgeons began to emerge from the prejudice against operative interference, it became the custom to carry patients to a rest station or casualty clearing station. They were put in the Fowler position; the general condition was improved by rest and warmth; food and water were withheld for two or three days, and morphine was administered.

As facilities for operative work developed at casualty clearing stations, operations were more and more frequently done. The early results were bad, due to getting cases too late, lack of the necessary facilities, and lack of experience among operators.

Early in 1915, after surgeons had commenced to operate and had a chance to study the causes of death among abdominal wounds, it was ascertained that the causes were as follows: (1) that the injuries were of such a nature that recovery must be a rare event; (2) that hæmorrhage was a chief cause of early death; (3) that bullets cause very extensive injuries.

The fact that hæmorrhage was the chief cause of early death caused surgeons to resolve that all men suffering from abdominal wounds and not too ill to transport, should be at once rushed to a casualty clearing station in motor ambulances and not detained in field hospitals.

The surgeons found also that lesions of hollow viscera were extensive, and that early operation gave the only hope of recovery. It became the rule to rush all abdominal wounds to the clearing stations for operation, and then it was that the recovery rate began to show signs of improvement.

The place to operate was established just back of the line when it was possible to erect a casualty clearing station. Otherwise a small operating center was opened for abdominal and other serious cases.

A table showing the time in which cases reached surgical care from the moment of injury shows that in 571 cases, 5 reached the operating table in two hours, three of these reached the base, and 2 died; 60 reached the operating center in two to four hours, 30 of these reached the base, and 30 died; 128 reached operating center in four to six hours, 75 of these reached the base, and 53 died; 114 reached the operating center in six to eight hours, 55 of these reached the base, and 59 died. From this time to the limit of twenty hours the ill-effects of delay are markedly shown. Of 83 received in the 20th hour but 27 reached the base, and 56 died.

Another table shows the prognosis as determined by the pulse-rate at the time of operation. Of those reported, 2 were received with a pulse of 60, of which 1 reached the base, 1 died; 9 came in with a pulse of 70, of which 7 reached the base, and 2 died; 48 reached the operative center with a pulse of 90, of which 30 reached the base, and 18 died; 147 reached the operating table with a pulse of 100, of which 108 reached the base, and 39 died. A higher rate in the pulse is attended with far more deaths than the number transferred to base.

A third table shows that the fatality of wounds by missiles is greatest after bullet wounds as follows: Of 197 wounds by bullets, 91 were transferred to the base, 106 died; of 259 shell fragments, 105 were transferred to the base, 154 died; of 55 shrapnel wounds, 15 were transferred to the base, and 40 died.

A fourth table shows the relative number of different projectiles and the proportion of lodged missiles in 834 cases as follows: Of 334 bullet wounds, 131 lodged. In 284 wounds by shell fragments, in 254 cases the missile was lodged. In 82 wounds by shrapnel, in 67 cases the missile was lodged.

A diagram shows the course of the projectile or its place of entrance in those cases in which cœliotomy proved that no hollow viscera had been penetrated. It is interesting to note that at least 9 of the entrance wounds were over the intestinal area. The majority were in the flanks just outside the ascending and descending colons.

It is now the practice to operate in all cases unless there are contra-indications, and to operate on principle rather than on indications as prompted by symptoms. Cases in which solid organs alone are wounded and on which there are no signs of continuing hæmorrhage should not be operated on. Operation should never be performed after thirty-six hours. In wounds over the liver it is possible to say from inspection that no other organ is wounded. In shots over the kidney and spleen, the likelihood of hollow visceral injury nearly always compels exploration. It is wise to observe a period of rest before operation to combat shock, and for this, heat is the most popular agent employed. When the missile is lodged, it should be localized before operation as this may influence the site of the exploratory incision. As a rule, the incision should be made by the side of the midline and be of ample length.

Subcutaneous salines in a shocked case are no longer favored since but little is absorbed. Injection *per vias naturales* is preferred. When these are not available the intravenous method should be used.

Axioms of operative procedure:

1. Celerity is important.
2. Body heat should be preserved in every way possible.
3. Viscera should be exposed and handled as little as possible. All intestines should be examined.
4. Suture of intestine should always be preferred to resection, save when latter is imperative.
5. A single continuous suture applied to invert the peritoneum is sufficient.
6. Linen or silk thread should be used instead of catgut.
7. Stitches must not be drawn too tight.
8. End-to-end anastomosis is preferred to lateral apposition.
9. Solid organs are to be disturbed but little unless missiles have opened them.
10. Excision of kidney and spleen should be practiced with great reserve.
11. Through-and-through wounds of the liver, except when the missile is lodged, should be left alone. Unless the lodged missile is removed, dangerous sepsis takes place.
12. Local drainage has no value except in local lesions.
13. Artificial ani in the colon should be avoided when possible.

Wounds of special organs: stomach. These have proved more fatal in this war than was supposed. Hæmorrhage and shock and complication with other visceral injuries add to the fatality.

Small intestine. Multiplicity of wounds and hæmorrhage from the mesentery are the chief causes of death. Captain Owen Richards resected 6 feet of gut for 20 perforations, successfully. In another case, 14 perforations were successfully sutured.

Large intestine. These are mostly fatal from sepsis of retroperitoneal tissue in the case of ascending and descending colons, and from complicating injuries in the case of the transverse colon.

Rectum. This is not often hit, but mortality is high in wounds thereto.

Liver. This organ has a large proportion of recovery with and without operation.

Spleen and kidney. Lesions of these organs are only attended with high mortality when excision is necessary.

Bladder. Wounds of viscus proper when intra-peritoneal have a fatality of 56 per cent. Complicated by small intestine wounds, fatality is high.

The causes of failure are: hæmorrhage, sepsis, and shock as chief causes. Hæmorrhage more often arises from the mesentery and the pelvic vessels. Sepsis includes peritonitis, retroperitoneal sepsis, and wound infection. Retroperitoneal sepsis with and without gas formation is very fatal. Shock is caused by multiple injuries, but it is often difficult to trace any definite relation between the amount of injury and the amount of shock.

The results in abdominal wounds operated upon in a sector of the British line are as follows:

Total number of cases.....	1,288
Arrival moribund.....	250
Total mortality, excluding moribund.....	50.06 per cent
Total mortality, including moribund.....	60.02 per cent
Considered with view to operation.....	1,038
No operation advised.....	73
Total operation.....	965
Total operative mortality.....	63.9 per cent
Total hollow visceral mortality.....	64.7 per cent
Stomach mortality, uncomplicated.....	52.7 per cent
Small gut mortality, uncomplicated.....	65.8 per cent
Colon mortality, uncomplicated.....	58.7 per cent

The estimated mortality in the early part of the war by rest and palliative treatment was about 80 per cent, which included all abdominal wounds. It is now known that some of these were not perforative. The operative method now observed seems to save from 15 to 20 per cent more than formerly.

One successful suture of a heart wound is recorded.

Arterial and vein suture to arrest hæmorrhage has seldom been attempted. Lateral suture of the veins and arteries has been done in a fair number of cases while the opportunity of end-to-end suture of arteries has rarely offered itself at the front.

Injuries of joints. Much has been learned of the treatment of joint injuries, and experience was chiefly gained on the knee-joint. Intra-articular drains were early abandoned. Excision of the wound is now employed in all cases, followed by removal of foreign bodies and the flushing of the joint; the wound is next closed under the strictest asepsis. When the joint wound is complicated with fracture it may still be closed with success after removing all loose fragments.

The primary treatment of joint wounds may be summarized as follows:

1. Fixation on a suitable splint, using one of the varieties of the "Thomas" splint.

2. Nothing more is required in simple perforating wounds.

3. An X-ray picture to ascertain the amount of lesion and the presence of foreign metallic fragments should be taken.

4. The wound should be excised, bone fragments removed, the joint explored, and lavage practiced.

5. Closure of joint cavity should be done when possible.

Head injuries. In the early part of the present war and in all recent wars gunshot injuries of the head were operated upon promptly whenever there was hope of recovery. The wounds of entrance and exit were cleansed of loose fragments of bone, foreign metallic fragments, and all dirt. The British surgeons in the Anglo-Boer War advocated operation at the earliest time. They operated under fire, and by candle light at night instead of delaying a few hours. Later operations to them meant sepsis, and sepsis meant encephalitis, abscess, hernia cerebri, and death.

Colonel Sargent advocates a delay of twenty-four hours or more because after injury the brain is liable to be œdematous and to extrude if operated upon while in this condition. Again, a moderate delay is beneficial in that it allows adhesions to form between the dura and pia mater thus lessening the chance of a spread of infection over the brain surface.

Experience in this war has brought out the following significant facts:

1. Cases which arrive at the base unoperated upon did better than those operated on at the front.

2. It has been noted that patients kept quiet at the place of operation do very well, while cases operated upon and apparently doing well are apt to arrive in bad condition if they are evacuated early.

It is now in order either to operate at the front and keep the patient quiet, or to evacuate him as soon as possible to the base before operation. The patient should not be operated on and then evacuated forthwith.

Special hospitals for head cases are erected at the front. On arrival at the casualty dressing station they are examined and dressed. If the pulse is low they are sent to the special hospital; if the pulse is rapid they are put to bed and evacuated later if they improve. The technique is as follows:

1. Wound in the soft parts and soiled fragments of bone should be excised.

2. There should be exploration in a limited way for missiles and bone fragments.

3. Drainage is not strictly necessary. The exposed brain is covered with scalp, also the bone and dura, either by simple suture, pericranial flap, or relieving incisions formed by under-cutting the scalp. A drain introduced under the scalp may be employed. By this method hernia cerebri is not so frequently seen.

4. In cases of depressed fracture over the longitudinal sinus there should be no interference; they should be left alone (Sargent and Gordon Holmes).

5. Dura should not be opened if it is found intact; true compression of the brain is seldom seen.

6. The use of novocaine and adrenalin locally often takes the place of a general anæsthetic. If this method is employed it should be preceded by hoscine and morphine or omnopon and scopolamine.

The foregoing plan of treatment may be summarized as follows:

1. Primary cleansing of the wound.
2. Transmission of the patient as soon as possible to the hospital where he will convalesce.
3. Taking of X-ray pictures.
4. Limited and careful exploration of the wound for foreign bodies.
5. Excision of the scalp and bone wound.
6. Covering of the exposed brain.
7. Closure of the wound, with superficial drainage, and prolonged rest in bed.

In fractures the tendency with British surgeons is to leave off all encircling splints and depend on extension for fixation of fragments. Slight constriction induces swelling and favors the development of gas gangrene. The Thomas splint is used almost entirely on the lower extremity. The wound should first be thoroughly cleansed of foreign matter, loose fragments of bone, and well drained by free incisions. The early deliberate and efficient cleansing of the wound is the basis of success, no matter what chemicals are used after it is completed.

The French surgeons are very partial to the use of permanent fixation splints, as well as for emergency use. In this they differ absolutely from British surgeons.

LOUIS A. LA GARDE.

Desjardins, A. U.: Wounds in War and Methods of Treatment. *J. Am. M. Ass.*, 1917, lxxviii, 18.

For the most part, the fighting in the present war is done in trenches built in soil which has been heavily manured for generations and which teems with micro-organisms of every variety. The trenches are deep and are filled ankle- or knee-deep with mud or water. If a man in the trenches is hit and falls, he lies in the mud until assisted by comrades, when an individual dressing is applied. He then walks if able, or is carried to the nearest dressing station (temporary field ambulance) located several hundred feet or yards back. Here the wounds are given the first real dressing by a surgeon, oftentimes the work being done under shell fire. In a large percentage of cases there is a considerable interval of time between the injury and the first dressing at the station.

From the station the men are sent back to the nearest field hospital where they are given tetanus antitoxin, their wounds are explored and drained, accessible foreign bodies removed and fractures temporarily splinted. The patients are then sent to the nearest evacuation hospital where wounds are more thoroughly drained, fractures permanently

splinted, etc. The next move is to the base hospital in Paris or some other provincial city. The average time before their arrival here is about two weeks.

Bayonet wounds are seldom seen except in the immediate fighting zone, men so wounded not often living to reach a base hospital. The effect of the pointed rifle bullet depends largely on the distance from which it has been fired, impact at short ranges causing extensive shattering and wide rents of skin and fascia. The effective range of shrapnel is not very great because the balls rapidly lose their initial velocity, and on the whole, their destructive power is not great.

The high explosive shells produce the most frightful wounds, their sharp irregular fragments tearing skin, fascia, and muscle and pulpifying nerves and vessels, causing wide-spread crushing, contusion, extravasation, and sloughing. The explosion of these shells causes such an atmospheric disturbance as sometimes to produce death without external wounds.

By far the most serious complicating factor is gas infection, due to the bacillus aerogenes capsulatus of Welch, the majority of infections being seen in deep wounds of the thigh. The pathology of these cases consists essentially of a wide-spread degeneration of the muscle fibers subjected to the increasing pressure of the gas resulting from the activity of the anærobies. This is followed by rapid systemic intoxication and septicæmia.

The establishment of field hospitals immediately behind the lines has been the means of saving thousands of lives, it having been shown that the mortality of cases with abdominal wounds depends absolutely upon the time between the reception of the injury and the operation.

One of the great problems has been the use of antiseptic in an effort to bring about rapid sterilization and healing. Sir A. Wright contends that antiseptics have no penetration and advocates the use of hypertonic salt solution, which causes a marked inhibition of bacterial growth.

Dakin's solution, the hyperchlorite, has lost some of its vogue, being so irritating as to erode the skin. Daufresne claims to have neutralized the irritating element and with this solution Carrel has been able to secure rapid sterilization of wounds, which are then sewed up. Chloramine is used by some, hypochlorous acid is advocated by others; Gray at Rouen favors complete excision and immediate suture; silver nitrate solution is favored; and with others ether dressings are popular.

Carrel's hospital is located a short distance back of the lines, so that most patients have been wounded but a short time. The wounds are immediately enlarged and explored, then filled with very fine catheters running into every corner and through these tubes Daufresne's solution is allowed to flow periodically. This is an efficacious method, undoubtedly, in this class of cases, but it is only to be advised in wounds that can be made thoroughly

accessible to the action of the antiseptic, in which case it does not seem to make much difference which of a number of antiseptics is used.

In badly comminuted fractures, loose pieces of bone should be removed, but pieces that are not detached should be left alone, as they spell the difference between a useful and a flail limb. It is surprising how well most fractures unite under proper treatment, but when they do not, because of too great loss of substance, Albee's method of autogenous bone transplantation facilitates their restoration.

Gas infection is treated by laying open the infected area by free incisions to supply ample drainage, after which continuous irrigation may be tried. If in spite of these measures, crepitation continues to extend, the limb must come off at once.

The greatest lesson to be learned from the surgery of this war is summed up in the two words, "intelligent conservatism."

E. K. ARMSTRONG.

Marquis, E.: The Actual Treatment of War Wounds (*Traitement actuel des plaies de guerre*). *Rev. de chir.*, Par., 1916, xxxv, 384.

Marquis reviews the various methods employed by different operators in the treatment of wounds since the beginning of the war, and the results obtained. From his study he arrives at these conclusions:

1. No other treatment found so far has surpassed early surgical intervention. Some of the followers of Carrel in the beginning thought that surgical intervention might be reduced. The results were deplorable.

2. The tendency now is to increase the use of primary resections, and Marquis thinks it is the method of choice for recent wounds. But it should be used only on two conditions: First, resection should be strictly confined within the indicated limits. Secondly, primary reunion should not be effected unless asepsis is certain and the patient can be followed till recovery. It has been proved that after evacuation wounds primarily sutured can become more or less severely infected. If asepsis and hospitalization can be guaranteed, then immediate suture is indicated; and although absolute asepsis is not indispensable in obtaining reunion the author has seen so many complications arise that he does not advise suture for a few days until the aseptic condition can be relied on.

3. Primo-secondary suture, which can be carried out from the sixth to the fifteenth day, gives more rapid recovery, reduces cicatrix, and gives better functional results. For its execution either of two procedures may be selected: (a) Continuous or frequent irrigation by Carrel's method facilitates this primo-secondary reunion, and the author has found it so in practice. (b) If for any reason application of the Carrel method is not possible, recourse can be had to lavage and dressing the wound with chloride of magnesium solution 12.1: 1,000.

4. After a battle when there is a large number of wounded there is little time to think of reunion. The points then claiming attention are rapidity of intervention and prophylaxis of infection. Immediately after intervention, the application of concentrated sea-salt solution — 14 per cent.

Such is the treatment of recent wounds. In the case of old wounds besides the more frequent employment of Dakin's fluid, and magnesium chloride, Leclainche and Vallée's serum and injections of paraffinated vaseline can be used.

The author emphasizes the necessity of direct transportation of the wounded to the place where they are to be treated and operated upon.

W. A. BRENNAN.

Pisano, G.: Early Operation of the Wounded; Advanced Surgical Posts (*L'operazione precoce dei feriti; le pattuglie chirurgiche*). *Policlin.*, Roma, 1917, xxiv, sez. prat., 1046.

Pisano refers to the necessity for early operation upon the wounded, now universally admitted. To execute important and delicate operations at a short distance from the firing line only two things are necessary, the operator and the operating room. Every infantry brigade ought have its advance surgical post in addition to the regimental advanced posts. There is nothing utopian in this idea, which has been realized for some time in France. To accomplish this it is necessary to get rid of the idea of the rapid clearance of the wounded, an obsession which obscures the true scope of the treatment of the wounded, i. e., prevention and cure.

The author suggests small, movable, rapidly disposable operating rooms provided with means of sterilization, elimination and operative facilities. In times of action these are to be pushed forward close to the regimental first aid posts, and the wounded properly operated upon and treated are sent at once to the hospitals. The idea is not to wait for the wounded to be gathered and brought in but to bring surgery to them on the spot where they fall.

W. A. BRENNAN.

Eastman, J. R., and Bettman, R. B.: Operative Treatment of Gunshot Fractures. *N. Y. M. J.*, 1917; cvi, 164.

It need hardly be said that infected gunshot fractures, and practically every gunshot fracture is infected, do not tolerate operative interference. The infection persists for months after the wounds have apparently healed and in such cases operation performed in what seems to be a clean field will cause a recrudescence. The simple undertaking of osteotomy and extension is not only much less apt to cause such a condition, but also meets every requirement in the way of providing accurate coaptation with good position. The excellent results which are obtained with simple extension, even many months after the fracture, demonstrate conclusively that open operation of healed gunshot

fractures should not be undertaken without due appreciation of the danger of lurking infection.

Lane plates and intermedullary splints have been used repeatedly in suitable cases. The plate has the advantage of being effective, easily applied and if necessary easily removed. The splints were mainly used for bridging large gaps, for example, a defect of the tibia of practically the whole middle third bridged by a long graft from the fibula, etc. Wire was used the same as in civil practice. The military surgeons are so cognizant of the danger of dormant infection in apparently healed gunshot fractures, months after a secession of all signs of a septic process, that they have suggested performing plastic bone operations, whenever possible, far away from the sight of fracture. For example, for a shortening of the femur due to a fracture at or near the neck, the incision is made over the lower third and the bone then lengthened in much the same way that a tendon would be.

The flapless or guillotine amputation which Van Buren Knott suggested has been revived and is used in cases in which, due to trauma of the soft tissues, the usual flaps could not be cut unless the proximal joint were sacrificed. The wide open surface is also conducive to good drainage. The skin and soft tissues are drawn over the stump by means of extension straps. As a rule the stump heals down to a small raw surface, which requires a reamputation to close, usually a very simple process. A modification of the typical guillotine operation is suggested, namely, cutting the anterior flap if possible a little longer than the posterior. This still allows perfectly free drainage and as a rule the stump can be closed over by means of the subsequent extension applied on the skin.

R. B. BETTMAN.

Lagoutte, M., and Le Grand, J.: The Danger of Incomplete So-called Urgent Operations in War (Du danger des opérations incomplètes dites "d'urgence" en chirurgie de guerre). *Presse méd.*, 1917, p. 455.

The authors refer to the fact that owing to the lack of sufficient facilities close to the firing line, many of the wounded are sent without delay to the clearing hospitals not having undergone a treatment calculated to avoid immediate complications such as gaseous gangrene. These first and hasty interventions consist merely in some large openings with drains. However, the study of anaerobic microbial action shows that such openings are quite insufficient and that what is necessary is wide removal of contused tissues. Mere incision with drainage gives a false sense of security.

The authors argue against the use of precocious incomplete operations. The operation should be complete from the very first. Such an operation in the case of a fracture not alone allows the removal of any foreign and useless fragments, but also primary suture, if the conditions are right. If the wound for some reason is not closed it will

remain, if not aseptic, with at least a minimum of infection.

The reports from some sections, that in 24 hours from 80 to 100 patients are operatively treated, have no value considered quantitatively alone. Among these 100 patients are many whose complications will require long and arduous treatment in successive hospitals before a doubtful recovery is arrived at, all of which might be avoided by spending some extra time originally on a complete operation at the most opportune time. While early intervention is a necessity, complete intervention is even more necessary.

W. A. BRENNAN.

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Klebs, A. C.: Palæopathology. *Bull. Johns Hopkins Hosp.*, 1917, xxviii, 261.

In order to give a concrete view of the possibilities of palæopathologic research the author reviews under separate headings some of the more recent findings, illustrating the pathology of past ages. He speaks of bone lesions, osteitis deformans, tuberculosis, osteoporosis, rachitis and syphilis, and other bone lesions, also injuries, fractures and dislocations (sepsis), and diseases of the soft tissues.

Klebs believes that palæopathology is only in its infancy. The comparative scantiness of facts so far brought out and the difficulties of the research, he says, should not hinder its energetic pursuit, but in the concatenation of specialized scientific inquiries it forms a previous link that well merits more widespread attention.

It must be recognized that injury and disease have played an important part in the history of mankind, and as Klebs states, it is only necessary to consider what definite influence they exert in our individual lives, what profound social upheavals have been brought about through the incidence of epidemics, less perceptibly perhaps, but none the less strongly, through widespread chronic ailments, through professional diseases; how whole districts and countries have been forsaken because disease made them uninhabitable, how diseases affecting early childhood and others producing sterility led to the gradual extinction of whole peoples. And also, he states, as regards the micro-organisms that are largely responsible for so large a share in our physical troubles, should it not be assumed that they also traverse evolutionary stages in their fight for existence in the same way as other forms of living substance? Evidence may be found of varying virulence, of their producing in one epoch recognizable though negligible diseases, in the other disastrous calamities. For the grasp of such problems, the study of disease, as it appears to us now, does not suffice, the author believes. The traces left during immense periods of time must be taken into account and it is just in such questions, not approachable by other methods, that palæopathology in time to come may furnish important solutions. GEORGE E. BEILBY.

Smith, T.: Significance of Laboratory Research in Medical Education. *Albany M. Ann.*, 1917, xxxviii, 351.

Medical education is not a fixed, definable quantity and it will continue to change with necessity which dominates all forms of education. Our views should be modest and tentative and free from rigid bias.

The dominating part of medical education should be a direct study of the patients. The physician is confronted constantly with new problems, and he should not allow himself to treat these merely in a routine way, but, for the good of the patient and succeeding patients, should develop the spirit of investigation. If he does not do this his sphere of usefulness becomes narrowed.

As to the significance of research, it is but necessary to point out the advances which have been made in the study of infectious processes, immunology, protozoology, chemotherapy, the significance of ductless glands, and in physiology. Scientific research is responsible for medical progress.

There are some who believe that enough research has already been done, that we now have more information than we apply and that no further work should be done. Research must go on, because it builds downward, as well as upward, and it is continually strengthening the foundations upon which the sciences rest. New conditions appear constantly which require adjustment.

Successful research requires a mind which does not hesitate to test the accuracy of existing data, and to lead to any permanent result it must be based securely on the known data of science. The world needs the influence of men accustomed to think. Research tends to individualize those engaged in it. The successful research worker knows more about his particular problem than anyone else. By bringing together many persons, an effective whole can be made. He who wishes to become a leader must be able to estimate the value of evidence, he must have his senses, his power of observation highly trained and keen, and he must know the fundamental concepts of natural science which interpret to us the phenomena of life. He must be able to formulate a problem and know how to deal with the solution of it.

The leading medical institutions are so shaping the course of study as to bring the student in touch with research, and whenever possible the teaching is done by bringing forth problems to solve. The methods of earlier workers are studied, analyzed, and criticized. The laboratories of an institution should be on a good financial basis. Poverty in scientific work may be good discipline if it is not applied too long and too continuously. The laboratories should all work together in a constructive research. The laboratory represents the place for study, the hospital the source of our data.

C. A. BOWERS.

GYNECOLOGY

UTERUS

Soler, J.: Calcified Fibromata of Uterus and Ovary (Caso de fibromas de ovaris y utero calcificados). *Rev. de cien. méd.*, Barcelona, 1917, xliii, 337.

The author's patient was a woman 51 years old whose case after examination he diagnosed as "probable malignant neoplasm of the left ovary with infiltration into the lower pelvis." A median laparotomy was done. The tumor was found to be the left ovary extraordinarily hardened, isolated, and embedded in the lower pelvis without adhesions. On continuing the exploration to the uterus, on its posterior wall and near the fundus a tumor about the size of a large bean was found which had the same hard, petrous feeling as the ovarian tumor. Both were extirpated. The ovarian tumor measured 12 by 5 cm. The histological report after examination was calcified fibroma. The patient made an uneventful recovery. About 3 per cent of uterine fibromata are calcified.

W. A. BRENNAN.

Case, J. T.: Comparison of the Operative and Radiotherapeutic Treatment of Uterine Myomas. *Surg. Clin. Chicago*, 1917, i, 579.

The writer, referring to former papers, assumes that roentgen rays and the rays of radium are practically identical, the choice being largely a matter of convenience in application. He then proceeds to contrast radiation and operative surgery, as follows:

1. Radiation, no mortality; operation, 2 or 3 per cent.
2. Radiation, a certain remote danger of necrosis or malignant degeneration, which is absent after operation.
3. The discomfort of the patient from "roentgen-kater" and the repeated treatments Case believes to be at least equal to, if not greater than, operative shock and recovery.
4. The possible mal-effect on the skin and the probable narrowing of the vagina (after radium) are placed against the operative scar and possible hernia.
5. Ovaries completely destroyed by radiation and often completely, or at least partly, saved by operation.
6. Radiation must be rather general while, by operation, myomectomy is often possible.
7. And, as of rather more importance, Case considers the added probability of accurate diagnosis by open operation.

In conclusion, "only cases of uncomplicated intramural fibroids, or cases in which operation is

declined or contra-indicated by serious organic disease, should be subjected to ray treatment. Possibly there are some extremely neurotic individuals for whom the rays would also be preferable. The ray treatment should not be used when time is a factor, and it cannot be used with safety in rapidly growing tumors, in fibroids complicating pregnancy, or where serious disease exists in the tubes or ovaries. The rays should never be used in any case where complete preliminary curettage with microscopic examination of the curettings is not feasible."

DAVID R. BOWEN.

Serrana, J.: A New Method of Treating Uterine Prolapse (Un nuevo metodo para combatir el prolapso uterino). *Rev. de med. y cirug. práct.*, Madrid, cxvi, 260.

The method proposed by Serrana of treating uterine prolapse is only a modification of existing methods, but it has been shown to have advantages in three cases treated by him.

In prolapsis of the second and third degree he used a silver wire, passing it through the rectus muscle and anterior face of the broad and round ligament; then through the muscular coats of the uterus without penetrating into the uterine cavity; then through the broad and round ligament on the opposite side and the parietal peritoneum and rectus muscle, making the uterus perfectly fixed to the posterior face of the anterior abdominal wall.

At first Serrana used this method only in the case of a woman past the menopause; however, he is of the opinion that it can be used equally well in cases of full genital activity, because, gestation being proved, it suffices to make a small incision in the anterior wall and withdraw the silver wire and the uterus will continue to grow with gestation.

W. A. BRENNAN.

Rizzati, G.: Different Cases of Spontaneous Uterine Laceration Without Mechanical Dystocia (Diversi casi di una lacerazione spontanea dell'utero senza distocia meccanica). *Policlin.*, Roma, 1917, xxiv, sez. prat., 1106.

Rizzati was called to a case of labor but when he arrived the woman was dead. The foetus showed a vertex presentation in the anterior position and was extracted by forceps. Autopsy showed a laceration of the left inferior segment of the uterus. Death had resulted in consequence of a peritoneal inundation. The pelvic genital canal as well as the foetus were normal.

This case of the author's and two similar cases observed by a colleague are quite different from the classical picture of a uterine rupture where there is

always some mechanical obstacle or some other deviation from the normal anatomical conditions. In the three cases referred to by the author there was spontaneous rupture of the lower segment in women with normal pelves, there being no mechanical obstacle to the fetal exit and dilatation being complete in the fundus. The causes of the uterine laceration must therefore have been a particular weakness of the inferior uterine segment.

The author thinks that there are two elements here of particular account, i. e., the multiparity and the age. He thinks that Herlitzka was right when he stated that the reconstitution of the inferior segment after birth is often imperfect in the sense that the muscular lamellæ do not assume their primary relations with exactitude and hence there arises a weakened condition of the lower segmental walls which predisposes them to laceration. Advanced age also favors these histologic changes. In none of the three cases could the clinical course be followed, so that it could neither be affirmed nor excluded that there was a threatened uterine rupture. The author thinks also that often in cases where there is believed to be some mechanical obstacle the real cause is the weakness of the uterine wall.

W. A. BRENNAN.

ADNEXAL AND PERIUTERINE CONDITIONS

Holland, J. W.: Torsion of Fallopian Tube Resulting from Small Ovarian Cyst. *South. M. J.*, 1917, x, 160.

Holland gives a comprehensive review of the literature and reports the case of an 18-year-old college student who two months before had an attack of abdominal pain, associated with nausea and slight fever, for which she was confined to bed a few days.

Pain and tenderness, which were located in the right lower quadrant, continued ten days. The next menstruation was similar to her usual periods. A week before admission, following a game of basket ball, she was suddenly seized with pain in the right lower quadrant, attended by slight nausea and followed by tenderness for a brief period.

On admission, three days later, the abdomen was slightly distended, with general rigidity, this being more marked on the right. Tenderness and muscle spasm were found over the right lower quadrant; temperature 99° F., pulse 105; albumin and numerous casts; leucocytes 13,000. There was no dysuria and the patient did not appear very sick.

The following day, under ether anæsthesia, vaginal examination revealed an orange-sized mass in the right pelvis, freely movable, irregular in outline, distinctly separated from the uterus and distinct from the ovary, which could be palpated as a separate mass. Uterus and left tube and ovary were entirely normal. On opening the abdomen, through a right rectus incision, 100 ccm. of bloody fluid escaped. The mass was found freely movable without adhesions and upon delivery proved to be

a small parovarian cyst, which had become rotated from left to right around the tube. The torsion involved the mesosalpinx and tube external to the mesovarium.

The ovarian vessels were not involved. The cyst was tense, the tube swollen, dense and leathery, and the tissues distal to the cyst pearly black in color. The appendix was subacutely inflamed and also removed. Recovery was uneventful, the patient leaving on the fourteenth day.

Most cases, as in this one, have acute onset and when on the right side the diagnosis is usually acute appendicitis. It is also frequently mistaken for acute salpingitis or tubal pregnancy. Rectal or vaginal examination under anæsthesia is the only sure method of diagnosis and even with this aid the diagnosis is frequently impossible.

Early diagnosis and operation are important as complete torsion invariably produces sloughing of the distal portion with infection of the peritoneal cavity. The greater liability to occur in pregnancy and the puerperium demand great alertness on the part of those conducting such cases.

L. R. GOLDSMITH.

Iraeta, D.: Fibroma in the Inguinal Portion of the Round Ligament (Fibroma del ligamento redondo en la porcion inguinal). *Rev. argent de obstet. y ginec.*, 1917, i, 161.

Iraeta describes a tumor of the round ligament in a woman of 28 years, which appeared in the third month of pregnancy. During gestation the tumor increased in size without producing any disturbance, reaching at term time the size of a fist. After delivery the tumor remained stationary. Upon extirpation the tumor was found to be exclusively formed of connective tissue. It was divided into two unequal parts by a sulcus which the inguinal canal muscles had formed.

Fibromata of the round ligament are not common. In 1910 Muhlen of Petrograd mentioned 76 collected cases, remarking the rarity of the intracanalicular variety.

Such tumors almost always develop on the right side, apparently confirming Conheim's law; but cases of multiple fibromata in both round ligaments have been reported. They do not give rise to any special symptomatology. Intra-abdominal tumors have never been diagnosed and the intracanalicular are confounded with prehernial lipomata, etc. Klemens found that in 634 hernias operated upon in the Prague clinic, 7 were tumors of the round ligaments diagnosed during operation.

W. A. BRENNAN.

Cullen, T. S.: The Surgical Methods of Dealing with Pelvic Infections. *Surg., Gynec. & Obst.*, 1917, xxv, 134.

When an appendix abscess is opened, the appendix can practically always be removed at the same time provided the abscess is well walled off with gauze before an attempt is made to open it.

In removing a large pus-tube that is firmly adherent to the pelvic floor, it is better to begin by excising a wedge of the uterine cornu and gradually freeing the mesosalpinx. The tube can then be lifted up as a straight rod and carefully walled off on all sides before it is shelled off from the pelvic floor. Soiling is reduced to a minimum.

Pelvic drains that emerge from the vagina should, if possible, be so placed that they do not come in contact with the small bowel. Vaginal drains laid in the pelvis during an abdominal operation should not be removed, as a rule, before the fourth or fifth day on account of the danger of pulling down an adherent loop of small bowel. The vaginal drainage of a pelvic abscess may relieve the patient only temporarily. The development of other incipient abscesses may require several more vaginal operations before the inflammation subsides and a subsequent abdominal operation may be necessary.

No case of pelvic abscess should be irrigated. There is danger of rupture of the abscess wall and of the escape of infectious fluid into the abdomen which will set up a general peritonitis.

Postpuerperal pelvic infections are found, as a rule, in one or both broad ligaments. Those in the broad ligament can be most satisfactorily opened extraperitoneally through a gridiron incision just above Poupart's ligament. Such accumulations should rarely, if ever, be opened through the vaginal vault.

EDWARD L. CORNELL.

EXTERNAL GENITALIA

Ward, G. G., Jr.: The Operative Treatment of Inaccessible Vesicovaginal Fistulæ. *Surg., Gynec. & Obst.*, 1917, XXV, 126.

The operation is accomplished by:

1. The use of deep paravaginal incisions to render the field of operation more accessible.

2. A longitudinal median incision of the anterior vaginal wall extending from the urethra through and beyond the fistula, and a lateral incision across the full width of the vaginal vault; then the thorough separation of the base of the bladder from the vagina and adhesions, care being taken to commence the dissection in the lower vagina, where there is an absence of scar tissue, in order to establish the line of cleavage.

3. Displacement of the bladder into the vaginal cavity by means of a sound passed through the urethra.

4. Suturing the opening in the bladder with catgut, and closing the vaginal incision with silkworm gut, being careful to catch the base of the bladder to one side of the site of the fistula, so as to bring the lines of suturing in different planes.

The points emphasized in the closure of inaccessible vesicovaginal fistulæ by the vaginal route may be summarized as follows:

1. Schuchardt's incision is the most effective means of obtaining free access to the vaginal vault for operative procedures in difficult cases.

2. This incision should not be confounded with the ordinary straight lateral colpoperineotomy.

3. The incision is a distinct addition to the resources of operative gynecology.

4. Free mobilization of the bladder is an essential requisite to the successful closure of inaccessible vesicovaginal fistulæ.

5. Free mobilization of the bladder is most easily obtained by first establishing the plane of cleavage between the uninjured vesicovaginal tissues.

6. Displacement of the bladder injury downward within reach by means of a sound in the bladder used as a lever and counterpoint is a decided aid.

7. Care should be taken that the sutures are placed in the bladder and vaginal walls in such a manner that the lines of incision are not superimposed.

EDWARD L. CORNELL.

MISCELLANEOUS

Davis, J. E.: Retained Secundines; a Study of Etiological Factors. *Tr. Am. Ass. Obst. & Gynec.*, Newark, N. J., 1917, Sept.

This paper involves a study of the literature from 1878 to 1917, and of curettings or other material obtained from 474 routine gynecological cases in which were found 70 pathological sections of unresolved decidua, chorion, or other foetal tissues, representing approximately 17 per cent of cases in which pregnancy was almost wholly unsuspected.

Ten per cent of all pregnancies end in abortion, according to popular estimates. According to many statistics 72 per cent of abortions are incomplete and of these 45 per cent become infected, whereas infection follows in 78 per cent where criminal procedures are used. Criminal measures are the greatest direct and indirect causes of abortion, 55 per cent to 65 per cent. Syphilis and endometritis are also prominent factors. A first abortion often leads to subsequent miscarriages and this explains 23.2 per cent of all cases. The mortality is given as 3.9 per cent, or ten times as great as in full term deliveries.

In spite of a thorough review of the literature in English, French, and German for the period 1878 to 1917, statistical values are scarce. This is due to the secrecy observed in regard to abortion, both criminal and otherwise. Furthermore many cases pass unrecognized, such as cases of retarded menstruation followed by profuse hæmorrhage.

Incomplete abortion results from difficult separation of the embryonal and maternal parts or from inadequate expulsive power. A portion which has undergone degeneration or necrobiosis may become separated alone and be expelled or retained by a rigid cervix; or, as is usually the case in criminal abortion especially after the first few weeks, the foetus may be expelled leaving the membranes adherent. Malpositions of the uterus may be instrumental in an early separation and in incomplete expulsion. Frequently monsters end in abortion also.

The preplacental stage ends in the third week but the placental tissues are not well developed until the sixth week, the trophoblastic cells up to this time providing nutrition by imbibition from the extravascular blood and lymph of the maternal tissues.

In the human placenta the union between the ovum and the maternal mucosa is very complete due to a gradual obliteration of the partition layers. This allows a free exchange of pabulum and excreta by the direct contact of maternal blood with chorionic villi. The embryonic tissues play a part in the digestion and assimilation of the food supplied and bear a resemblance to intestinal villi.

In recent studies the ovum is considered capable of enzymic production in its trophodermic cells by which it digests the adjacent uterine mucosa, thus forming a cavity for its implantation. The placenta is formed to control this dissolution and protect the maternal organism. But up to the end of the fourth month of gestation the catabolism predominates.

The uterine stroma is a highly labile protoplasm very susceptible to nutritional influences. Due to its colloid content it avidly absorbs fluids, thereby effecting the changes incident to pregnancy, menstruation, or chorio-epithelioma. This process is most marked near the chorionic villi and predisposes to hæmorrhage which is easily understood from a study of the nature of the blood-vessels of the uterine mucosa. In the pregnant state these vessels have practically no walls but are really blood spaces or channels through the stroma.

And here lies the crux of the entire question of abortion; and whether it is complete or incomplete depends upon the nature of the intercepting pathological factors. Of these factors criminal measures comprise over 50 per cent. Syphilis, endometritis, metritis, malposition, and inadequate placental sites, all may cause circulatory disturbances leading to partial separation, then hæmorrhage, death of the foetus, and incomplete abortion with retained secundines. The principles involved from whatever cause may ultimately have the same end-result of determining improper enzymic production and interaction with resulting abnormal metabolism, death of the foetus and incomplete expulsion.

Wiggers, H. H.: Hæmorrhage at the Menopause.
J. Am. Inst. Homœop., 1917, x, 153.

Wiggers, under this title, writes of the good results from the use of radium in this class of cases. In fibroids, its application within the uterus causes destruction of the endometrium, partial or complete, depending upon the age and vigor of the patient and on the mode of application. If the endometrium is totally destroyed, aménorrhœa results: if only partially, a decreased flow. The

same applies to the leucorrhœal discharge. Menstrual colic, whether uterine or ovarian, is relieved at the same time.

The author has several cases in which a two-hour application brought down a profuse flow lasting 8 to 10 days to a normal flow of 3 to 4 days, remaining thus one to one and one-half years, when a second application brought it to normal again. The treatment is especially to be considered in fibroid subjects who are not good operable risks, owing to anæmia or heart or kidney affections.

In malignant conditions, the success of the treatment depends upon early recognition. In the beginning the growth is localized and strictly confined within the uterus. A radical operation is certainly the indication then, but when this is no longer feasible palliative treatment only is available and the author mentions cauterization by the Percy method, zinc chlorid, Gellhorn's acetone treatment, massive roentgen rays by the mapped-out areas and especially electric cauterizing and γ -rays of radium. By this method, many are to all intents and purposes restored to almost normal health.

Recurrences do occur and the patient may die of general carcinomatosis. In the meanwhile, however, they have been comfortable, their lives prolonged and in many instances they are free from suffering and foul discharges. During this treatment, alfalfa alone or combined with potassium hypophosphite is useful in building up the patient's strength. This is advocated by Ross, on the theory that in cancer cases the potassium salts are deficient and that potassium phosphite supplies this deficiency.

L. R. GOLDSMITH.

Longyear, H. W.: The Relations of Gynecology to General Surgery, Past and Present. *J. Am. M. Ass.*, 1917, lxix, 501.

It is the author's belief that the gynecologist and abdominal surgeon, as a specialist, has passed the zenith of his activity, under present conditions; that the future promises a still greater position than that enjoyed in the past; but that it must be attained by means of a broader education and through the medium of general surgery of the highest order and broadest understanding. The general surgeon of today is doing the major part of the abdominal and pelvic work because he is a better general surgeon than the gynecologist. It is this broad understanding of surgical problems in general that begets confidence, and confidence begets patients, and patients beget patients!

The surgical millenium has not yet arrived, but when it does the lion and the lamb will be seen lying down together, side by side, and not the one in the relation of nutritive pabulum to the digestive processes of the other.

EDWARD L. CORNELL.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Lockyer, C.: Two Cases of Primary Ovarian Pregnancy. *Proc. Roy. Soc. Med.*, 1917, x, 158.

The author reports two cases, the first of which occurred in a woman, 23 years old, who had borne two children, the younger being one year old, and subsequently there had been an abortion—seven months before admission to the hospital. The catamenia for the past six months had been regular, every four weeks, lasting from five to seven days, until three weeks previous when the flow appeared one week before time and had continued. For seven weeks there had been continuous pain in the lower abdomen and in the sacral region of a sharp and stabbing character, worse on movement and after food, and considerably aggravated during the periods.

The pathological specimen consisted of the left fallopian tube attached to the left ovary by its mesosalpinx. After hardening in Kaiserling-Pick's solution, the following observations were made: Left tube measured 7 cm. in length and 1.2 cm. in diameter. To its outer coat were attached a few filmy adhesions. The abdominal ostium was closed, but the ampullary end was not dilated. The mesosalpinx was translucent; it separated the tube from the ovary by a vertical distance of 1.7 cm. The left ovary with its contained hæmorrhagic cyst measured 7 cm. in its vertical and 4.8 cm. in its transverse diameter. It was divisible into an upper (apparently) solid portion measuring 2.5 cm. by 4.3 cm. and a lower cystic portion measuring 4.5 cm. by 4.8 cm. On bisection of the ovary, what had appeared to be solid ovarian tissue was hollowed out centrally, due to invasion thereof by the blood-cyst situated below. Microscopically, within the clot were seen chorionic villi, for the most part very degenerated, but showing, in some cases, strands of trophoblast bounding a fibrous core.

The second case was that of a married woman, aged 33. At operation no free blood was found in the peritoneal cavity. To the right of the uterus lay an enlarged ovary, which was adherent in the right posterior quarter of the pelvis, but which was brought up without difficulty. The left ovary was cystic and its lower half, containing two cysts, was resected. Both fallopian tubes appeared to be quite normal. The right tube and enlarged right ovary were removed. The right ovary measured 5 cm. by 4 cm. The upper part, 2 cm. by 3 cm., was composed of solid ovarian tissue which capped the lower segment, 3 cm. by 4 cm., which consisted of a blood-cyst. The latter was very sharply differentiated from the former. The cystic portion was enclosed in a capsule

made up of ovarian stroma which showed no sign of having ruptured. On microscopic examination the conditions revealed were very similar to those of Case 1, i.e., the ovarian stroma showed numerous dilated and engorged blood-vessels which lay outside a necrotic zone in which the remains of a ripe corpus luteum were still visible—but here and there was seen a definite invasion of ovarian stroma by chorionic villi, one of which appeared within a blood-vessel as an instance of *verschleppung*. Within the clot itself was seen the lining of the chorion-amniotic sac with large branching villi proceeding from the chorionic membrane, shown by epidiascope, but no foetus could be found. The gestation sac and the escaped blood were enclosed in a cyst, the inner lining of which was composed of degenerate lutein cells. The villi were old and degenerate, but some still showed the remains of a syncytial investment. The author reviews the cases occurring between 1910 and 1917.

EDWARD L. CORNELL.

D'Erchia, F.: Threatened Interruption of Extra-Uterine Pregnancy, Its Continuation for Unusual Periods (Minaccia d'interruzione della gravidanza extrauterina e sua prosecuzione in periodi inordinati). *Ann. di ostet. e ginec.*, 1916, lxxxviii, 465.

D'Erchia reports the case of a nullipara, 30 years old, who became pregnant after 11 years of sterility. General disturbances for which she consulted a specialist led to a diagnosis of right tubal pregnancy. A later more detailed examination led to a diagnosis of lesion of the right uterine adnexa with a probability of extra-uterine pregnancy. The patient was kept under observation but suddenly developed an intense right iliac fossa pain with hæmorrhage, etc., and was operated upon in a dying condition. The abdominal cavity was found filled with partly coagulated and partly fresh blood. The gravid sac, being detached from its omental and ileocæcal adhesions, showed a large breach from which issued a macerated dead foetus of about five months, lying in the right iliac fossa. The whole right adnexa and placenta were in the sac of Douglas covered with thick adhesions to the gravid sac, to the posterior wall of the uterus, and to the right broad ligament. The adnexa and foetus were removed. The patient recovered.

The author gives a lengthy review and discussion of similar cases occurring in literature and draws these conclusions:

1. It is possible that an extra-uterine pregnancy even with repeated threats of interruption, may continue its course under the form of extra-tubo-abdominal or secondary abdominal pregnancy.

2. That the study of extra-uterine tubo-abdominal or secondary abdominal pregnancy is to be regarded not alone from the anatomo-embryological viewpoint, but also from the clinical, especially as regards its origin, when there are repeated threats of interruption with either partial or total passage of the ovum into the abdomen.

3. Diagnosis is a matter of very great difficulty, and prognosis must always be reserved on account of the dangers arising from the position which the ovum assumes in regard to the surrounding organs or becoming free in the abdominal cavity, as well as from the new placental insertion.

4. The treatment is in general that of extra-tubal pregnancy.

W. A. BRENNAN.

Fieux, G.: Indications for Antepartum Symphyseotomy (Indication de la symphyséotomie antepartum). *Ann. de gynec. et d'obst.*, 1917, lxxii, 518.

Fieux gives the details of six cases of labor with a contracted pelvis, etc., in which an antepartum symphyseotomy allowed an easy birth with a living child. In all these cases previous labors had been terminated by the forceps at term with a dead foetus. While the cesarean operation is indicated in grossly contracted pelvis or in cases of complex dystocia Fieux thinks that symphyseotomy is the operation of choice when the development of the foetus is not excessive and when the useful diameter of the flattened pelvis remains about 8 to 9 cm. Pelvotomy permits foetal expulsion or extraction without violence after a symphyseal separation of from 4 to 5 cm. It rarely or never causes vaginal, vesical, or urethral lesions; it respects the sacroiliac symphyses, and it affects neither posture nor walking. Moreover it is a prophylactic operation for future labors.

When the operation is limited to suitable cases the postoperative course is simple. In his own practice the author had no death in 21 cases. When symphyseotomy is done prior to parturition it is rapid and simple and may even be compared to a tenotomy. The amount of separation needed is about 4 cm. Retrosymphyseal hæmorrhage is practically nil contrary to what is observed when a symphyseotomy is done intrapartum. The operative wound has little chance of becoming infected, and the birth, whether spontaneous or aided by the forceps, taking place from eight to fifteen days later is not affected by this prior operation.

Fieux, therefore, is far from sharing the opinion of Vorhees, that symphyseotomy is an operation of the past; and he asks French accoucheurs to restore it to the place it ought reasonably to occupy. The operation kept within its limited indications has this immense advantage: that while the cesarean operation leaves the pelvis unchanged and mutilates the genital apparatus, pelvotomy always improves the pelvic condition and leaves the reproductive organs in their normal anatomic and functional condition. No obstetrician can be indifferent to this latter fact.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Gossett, W. B.: Anaesthesia in Obstetrics. *Therap. Gaz.*, 1917, xli, 81.

Like the majority of other obstetricians, the author has employed all kinds of anaesthetics during childbirth. The first was chloroform which he used more than twenty years. Ether he has used less extensively in obstetrical work. He considers the use of ether somewhat dangerous in addition to the fact that when given in sufficient amounts to induce analgesia, or anaesthesia, the object to be accomplished in childbirth is defeated since the expulsive efforts are minimized and labor is retarded unless instrumentally completed or pituitrin administered.

The author has used both the intraspinal injection of cocaine, which certainly makes labor painless, and the so-called twilight sleep, but he considers both too dangerous for general use.

More recently he has used nitrous oxide and oxygen administered by a trained anaesthetist with most gratifying results. The only objection he can see to this method is the greater cost. In nitrous oxide and oxygen he thinks we have an almost perfect method for inducing analgesia and anaesthesia.

In his opinion the time is coming when hypnosis will be used extensively in obstetrical practice.

C. H. DAVIS.

Hirst, B. C.: The Intermediate Repair of the Injuries of the Genital Canal in Childbirth. *Am. J. Obst.*, N. Y., 1917, lxxvi, 50.

In the author's opinion at least half the patients coming to the gynecologist are doing so because of lacerations of the genital canal. The fact that primary repair of these lacerations has been practiced for more than a generation and that we are still confronted by these patients indicates that this practice must be inefficient.

The repair can not be done properly immediately after childbirth because the field of operation is obscured by a profuse bloody discharge; the operation is usually conducted on a bed with insufficient and inefficient assistance; and the tissues are bruised, pulled awry and distorted. The man who poses as a specialist should repair these tears so that subsequent discomfort and another operation should not be necessary. To accomplish this the author waits one week after delivery to make the repair when the cervix and other structures are less distorted and there is less danger of infecting the endometrium. This practice he has carried out for fifteen years in all classes of patients with entirely satisfactory results.

W. L. BROWN.

Odrizola, E. F.: Contribution to the Study of Posterior Vertex Position (Contribucion al estudio de las posteriores de vertice). *Cron. méd.*, Lima, 1917, xxxiv, 212.

From a study of more than 300 cases of posterior vertex presentation made since 1910 the author concludes as follows:

1. In that variety of presentation made known under the name of posterior vertex, the placenta is also inserted in the lower segment; it cannot be considered as a normal type of position and consequently calls for special care and precautions.

2. Posterior vertex positions result in particularly painful labors, both during the dilatation and expulsive periods, requiring a course of conduct which left anterior positions do not require.

3. In posterior vertex positions the dilatation of the uterine neck frequently shows the two types of anatomic and spasmodic rigidity, and hence demands an excitatory or artificial dilatation.

4. The relatively considerable infantile mortality is higher than in other varieties of positions and is in direct relation with the greater or less extent of the placental surface involved in the engagement of the head, hence it is deduced that in posterior vertex presentations it is not possible to guarantee the life of the child in a labor which is apparently quite normal and physiologic.

5. In posterior vertex presentations the parturients are much exposed to infection for two reasons: (1) because the placental wound is more accessible to pathogenic influences, which is a logical deduction of investigation; and (2) owing to the series of manipulations which this species and variety of position calls for.

6. In cases of intervention with the forceps, transformation into occipito-sacral and direct applications are the preferable methods.

W. A. BRENNAN.

McCormick, J. J.: Premature Detachment of the Placenta. *Virg. M. Semi-Month.*, 1917, xxi, 505.

The author reports 3 cases of premature detachment of the normally planted placenta: one was concealed hæmorrhage; one external; and one external and internal.

The treatment is immediate delivery, by forceps or version — the cervix permitting — or by cæsa-rean section, in case of a rigid os. W. F. HEWITT.

PUERPERIUM AND ITS COMPLICATIONS

Beruti, J. A.: Treatment of Puerperal Septicæmia by Sera and Vaccines (Tratamiento de la septicæmia puerperal por sueros y vacunas). *Rev. Asoc. méd. argent.*, 1917, xxvi, 595.

Beruti reviews the history of the serum treatment of puerperal septicæmia. As regards specific antistreptococcic serum his experiences and his studies of the results obtained by others is that this method is a distinct failure. The course of its action is not known; nor is it known whether a mono- or polyvalent serum is the better. The laboratory, the clinic, and statistics have failed to solve the problem of whether or not to apply specific serotherapy in the different forms of puerperal fever.

Prophylactic serotherapy is irrational. The endovenous route is irrational. Massive doses are irrational. Regarding the sera of convalescing

puerperal patients, the so-called specific homosero-therapy, there are no positive results to act as guide.

Experience has shown that better curative results have been obtained from the use of non-specific sera, but there are no systematic studies of the action of these agents in puerperal infections. In South America subcutaneous injections of normal horse serum prepared according to the method of Raymond Petit have been employed in Montevideo by Pouey and Turenne with excellent results. In one case there was a leucocyty increase from 4,500 to 25,000 and a case of peritoneal septicæmia was cured.

Beruti has himself treated some severe puerperal infections by endovenous injections of horse and beef serum, either warmed or not, with small single doses not exceeding 20 ccm. He has obtained some notable cures which were not obtained with specific sera. He believes that the anti-infective action of the serum of animals previously bled is more potent than common normal serum. However, a favorable or unfavorable result is a matter of chance. The clinical effects and reaction phenomena of non-specific sera are very similar to those of the specific. Beruti is further of the opinion that the local application of non-specific sera is a rational method of early treatment of puerperal infections, when not generalized; that the leucocytogenic action of warm normal horse serum (Raymond Petit method) is unquestionable, and therefore favorable, and that this method has no serious inconveniences or dangers.

Beruti next considers vaccine therapy and finds that the clinical and experimental results obtained both at home and abroad with specific vaccines are fully as contradictory as in the case of specific sera. They have not given immunity, and in practice have not fulfilled what they promised in theory. Although 68 years have passed since Semmelweis discovered the etiology of puerperal fever, and 38 since Pasteur found the microbean agent, none of the innumerable local and general treatments, nor antiseptics, colloids, sera or vaccines have really proven to be a really efficacious specific agent in puerperal fever.

Although heterotherapy, especially colon bacillus vaccines, has given many favorable results in South America and elsewhere, Beruti's own attempts in severe cases of puerperal septicæmia with this agent have been very unsuccessful. In some cases the reaction was excessive and clearly prejudicial.

Owing to the ignorance which prevails and the different theories existing regarding the precise therapeutic action of colon bacillus and other extracts Beruti thinks that the physiologic action of these agents should be studied by animal experimentation. He has made a number of experiments himself on dogs and rabbits. His opinion based on his results is that there is something more than the action of albuminoids and colloids intervening in the formidable reactions of these medicaments which sometimes cure and sometimes do not; why they so

act, having a beneficial effect on occasions on the organism and other occasions a reversed effect, is an unsolved mystery.

W. A. BRENNAN.

Vanverts, J.: Puerperal Phlebitis; Ligation of the External Iliac Vein (Phlébite puerpérale; ligation de la veine iliaque externe). *Ann. de gynéc. et d'obst.*, Par., 1917, lxxii, 365.

A woman of 23, a II-para, showed a puerperal phlebitis of the lower limb and a phlegmon of the broad ligament. Operation was done for the latter. The classical incision for ligation of the external iliac exposed the broad ligament; the tissues were indurated but there was no pus. The external iliac vein at its termination appeared healthy to the author and he placed a double ligation there. Following this there was for some days a diminution of fever, then the temperature rose again and death occurred nineteen days later with symptoms of septicæmia and perhaps an orbital phlegmon. It does not seem to the author that in this case ligation of the iliac vein had the least result. He thinks that the peritoneal route does not allow ligation of the pelvic veins at points sufficiently high and healthy, nor does it permit a sufficient exploration of the veins. If venous ligation is attempted in cases of puerperal phlebitis the transperitoneal route should be used, not only for better exploration but for better scope of technique.

W. A. BRENNAN.

MISCELLANEOUS

Bandler, S. W.: Internal Secretions in Obstetrics and Gynecology. *Am. J. Surg.*, 1917, xxxi, 156.

In this discussion, the author has confined himself to a consideration of the three glands that are "intimately associated with the development of the genital organs and with their trophic care," i.e., the ovary, thyroid, and hypophysis.

The author frankly states that we know very little regarding the specific therapeutic indication of the extracts of these glands and, therefore, we must rely upon our knowledge of their physiology. At the present time, the inter-relationship of the physiological action of the internal secretions is so confusing that no hard and fast rules can be laid down regarding their therapeutic indication.

Bandler believes in the dictum, "Make as accurate a diagnosis as is possible, and then give a mixture of all the glands that are apparently implicated in the particular diseased condition."

In gynecological practice there are innumerable

conditions, formerly thought to be operative, that are amenable to local treatment plus the proper administration of extracts of the internal secretory glands. Many cases of sterility may become pregnant after long-continued large doses of ovarian substance. Furthermore, thyroid and hypophysis, or thyroid, hypophysis, and adrenal extracts in cases of asthenia, work wonders if given over a long period of time.

Pituitrin in obstetrics, a subject about which the author has said a great deal, comes in for further consideration. Small doses, 2 to 5 minims, repeated every half hour, are recommended to start labor pains, as well as to strengthen the contractions in primary or secondary uterine inertia. Pituitrin is not used during the third stage of labor for, as the author states, it produces forceful contractions with periods of marked relaxation, and it is during this period of relaxation that hæmorrhage is apt to occur.

In conclusion, the author emphasizes the fact that without a definite knowledge of the physiology and pathology of the endocrine system, one cannot do justice in the treatment of a patient.

HARVEY B. MATTHEWS.

Costa, R.: The Yellow Coloration of the Liquor Amnii a Sign of Effusion of the Rachidean Fluid and Foetal Monstrosity (La colorazione gialla delle acque dell'amnios quale segno di effusione del liquido aracnoideo e di mostruosità fetali). *Gazz. d. osp. e d. chir.*, Milano, 1917, xxxviii, 583.

The author emphasizes the importance of the color of the amniotic fluid in certain diagnoses. A greenish color is a sign of foetal suffering; a reddish hue suggests maceration. But the significance of a yellow color is not commonly known as this color is not often observed. This coloration has reference to the effusion of the cephalorachidean fluid in the amniotic fluid. To effect it a solution of continuity of the dura mater and arachnoid is necessary, or some disturbance in the osseo-craneorachidean canal and teguments of the foetus. This as experience shows does not always happen with normal foeti but rather under abnormal circumstances, such as hydrocephalus, spina bifida, myelomeningocele, etc. The yellow coloration is consequently a sign of one of these conditions.

The author considers that important deductions can be made from the observance of this sign, both as regards the proximate and remote prognosis.

W. A. BRENNAN.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Stillman, S.: Tumors of the Kidney. *Calif. St. J. Med.*, 1917, xv, 363.

Stillman relates his experiences with tumors of the kidney in a series of 7 cases of his own and 6 of his immediate associates.

In 5 of his own cases he made the diagnosis before operation, but a diagnosis of tumor was also made in a good many that were not tumors of the kidney. He employed the knee-chest position and in doubtful cases the Israel method. Hæmaturia was the initial symptom in all except two sarcomata in children. The hæmorrhage was quite profuse, independent of exertion, and in all three cases blood-casts of the ureter could be seen. The two cases of sarcoma did not have hæmaturia, as they rarely do. Pain was a marked symptom in only one case, and was of a steady, dull, dragging character. Two patients complained of pain only during the attacks of hæmorrhage.

The author claims that it is easier to diagnose tumor of the kidney than to exclude it, and has himself mistaken hydro- and pyonephrosis for a tumor of the kidney. Cancer of the splenic and hepatic flexure of the colon and of the ascending colon, and also cancer of the liver were mistaken for tumors of the kidney. An hypertrophied right kidney that was giving rise to hæmaturia was also mistaken for tumor.

Stillman emphasizes the fact that tumors of the kidney are not common; that they are not necessarily painful except when bleeding; that they are not tender, or at least very moderately so; that they are not accompanied by fever; that they do not raise blood-pressure; that they do not have sharp edges, and that they do not occasion blood or mucus in the stools or cause partial obstruction of the bowels unless very large.

The prognosis, the author declares, is notoriously bad in malignant tumors of the kidney, and the most distressing feature is that it bears little relation to the size and duration of the growth. A very small hypernephroma may invade the vessels and metastasize very early, while a very large one may not metastasize at all. Recurrence is rare after five years, but has occurred as late as ten years. Stillman believes that if careful physical examination, including X-ray plates of the bones, fails to disclose any evidence of metastases, nephrectomy should be undertaken. The operative mortality, even in infants, is not sufficient to contra-indicate it, although the prospect of ultimate recovery is not encouraging. In adults Stillman makes a lumbar incision, beginning at the twelfth rib, passing the

border of the erector spinæ muscle to the crest of the ilium, and then parallel to this and half an inch above it across the abdomen as far as necessary; this is practically Koenig's incision. In no case was a clamp applied to the pedicle. As much as possible of the perirenal fat was removed and the wound in some cases drained, in some not.

LOUIS GROSS.

Magnini, M.: Clinical Observations and Experimental Research on Solitary Cysts of the Kidney (*Osservazione clinica e ricerche sperimentali sulle cisti solitarie del rene*). *Policlín.*, Roma, 1917, xxiv, sez. chir., 180.

Magnini's experimental researches regarding the pathogenesis of solitary cysts of the kidney were made on dogs. From his results as well as from his clinical observations he is of the opinion that such solitary cysts form a morbid entity which is quite distinct from polycystic kidney. In the human kidney a local inflammation or a slight calculous concretion suffices to constitute a point of departure for a solitary cystic degeneration, while polycystic kidney is due to a congenital cause which may be hereditary or to a diffuse sclerotic degeneration of the whole kidney. This may be one of the expressions of a general arteriosclerotic process accompanied by arterial hypertension and cardiac hypertrophy with modifications in the urinary system as in chronic interstitial nephritis. Polycystic kidney is often clinically found associated with cystic malformations in other organs. Nothing of the kind is found with solitary cyst where the only phenomenon is local disturbance on hypochondriac compression where the cyst is voluminous accompanied by gastro-intestinal disturbance and emaciation. But if the cyst is small such signs are lacking and diagnosis is almost impossible.

Solitary cysts do not originate from a simply mechanical factor but rather from a circumscribed inflammation in a limited region of the renal parenchyma.

The application of a silk suture knotted in the parenchyma suffices to experimentally produce cysts circumscribed to the zone of the knot.

Clinically solitary cysts, unless they cause local disturbances by notable volume, pass unobserved especially in the absence of vascular and cardiac lesions, while these are immediately noted in polycystic kidney offering a very complex pathologic picture. Such solitary cysts do not cause quantitative or qualitative urinary changes contrary to what is observed in polycystic kidney.

W. A. BRENNAN.

Monteverde, V., and Perez, M. L.: Observations on Congenital Ectopic Kidney (Consideraciones sobre la distopia renal congenita). *Rev. argent. de obst. y ginec.*, Buenos Aires, 1917, i, 145.

The author's case of congenital ectopic kidney occurred in a woman of 35 years. Palpation posteriorly and on the left side of the uterine fundus disclosed a tumor about the size of an orange, movable and somewhat resistant; beyond the tumor in the left iliac fossa a body like an ovary could be felt. The case was diagnosed as a left ovarian cyst and operated upon. Operation disclosed the fact that the supposed cyst was not an ordinary tumor but was more like some misplaced organ, probably a kidney from the appearance. The left kidney pelvis was found vacant while the right kidney was normal. It was then manifest that the pelvic body was an ectopic kidney. It was freed from adhesions, placed in its normal position as there were no signs of degeneration and the peritoneum and abdomen were closed.

Unilateral ectopic kidney is more frequent on the left side than on the right. In Straeter's statistics there are 34 left for 19 right. It occurs more frequently in women than in men, there being 53 cases in women and 13 in men.

The author's case coincides with what is known of this anomaly. As in all cases published it had not been diagnosed before operation, there being a complete absence of urinary or other symptoms which might have led to a suspicion of it. Nor was there in this patient any concomitant absence or malformation of other organs such as has been found in other recorded cases.

As regards the procedure followed, the question of extirpation occurred to the authors, but as there had been no previous examination of the functioning, and as the ectopic kidney had all the appearances of a kidney with functional capacity, it was decided not to extirpate it, but to close the abdomen.

W. A. BRENNAN.

Newman, D.: Horseshoe Kidney by Union of the Upper Poles, Diagnosed Prior to Operation, with Calculus in Lower Pole on Left Side. *Lancet*, Lond., 1917, cxciii, 236.

The author reports an interesting case that came under his observation of a horseshoe kidney formed by fusion of the upper poles, diagnosed prior to operation as renal calculus. Cystoscopic examination showed moderate congestion of the mucous membrane at the neck and in the trigone. The left ureteral orifice gave distinct evidence of irritation, the urine escaping therefrom being purulent. The X-ray showed an oval shadow close to the point of the left transverse process, not movable on deep respiration. Under an anæsthetic, a horseshoe shaped mass could be made out, whose bridge joined the kidneys an inch and a half below the ensiform cartilage. Both lines of the shoe were narrow bands and extended down to the level of the transverse processes of the second lumbar vertebra.

Pressure on the lower pole of the left kidney caused the patient to complain of pain at a corresponding point on the right side. The diagnosis of calculous pyelitis in a horseshoe kidney was made and confirmed at operation.

I. S. KOLL.

Bartlett, W.: New Operation for Movable Kidney. *J. Am. M. Ass.*, 1917, lxix, 625.

The author states that, in the light of our present knowledge, the one definite and invariable indication for operative treatment of movable kidney must be of an anatomic nature, namely, intermittent hydronephrosis, as expressed by a roentgenographic demonstration of a dilated kidney pelvis, atrophy of the apices and a kink in the ureter, while all other types of movable kidney are subjects for medical treatment. Accordingly he has devised an operation which is physiologic in so far as it imitates nature's effort to hold the kidney in place by the deposition of fat in and around it. The technique of the procedure rests in principle on the well-known clinical observation that the kidneys tend to become more than usually movable as an individual's body fat disappears; whereas this mobility decreases as weight is regained.

The technique of the operation is briefly as follows: Through the old von Bergmann incision, which bisects the angle formed by the last rib and the outer edge of the erector spinæ, all the fat is removed from the inside of the posterior abdominal wall, leaving the muscles perfectly bare in the kidney fossa; the fatty capsule is then divided longitudinally the entire length of the organ, caught with clamps and inverted over on to the pedicle of the exposed kidney, so that, when it lies completely outside the wound edges, the inverted fatty capsule occupies a position beneath its lower pole. There by several catgut sutures, it is transformed into a considerable ball of fat, which in most instances is about half the size of the kidney itself. The ball of fat is then transposed into the defect into which the kidney formerly slid, by anchoring to the inner aspect of the abdominal wall directly under the lower angle of the wound, and the posterior abdominal wall is completely closed in layers without drainage.

The removal of the self-lubricating lining of the extraperitoneal cavity, which is substantially filled out below the kidney, and the definite opposition of the bared muscles of the posterior abdominal walls, which enhances the formation of adhesions, are the principal objects accomplished by this operation.

The after-treatment consists in accentuating the various mechanical influences which normally tend to force the kidney to a higher level and keep it there. This is done by means of a binder with a soft elastic pad of common cotton batting over the right anterior abdominal wall, by elevation of the foot of the bed, etc., and enforced feeding, in order to keep the size of the newly constructed fat pad corresponding to any increase of the general body fat. The author has employed the operation successfully in 20 cases.

M. KROTOZYNER.

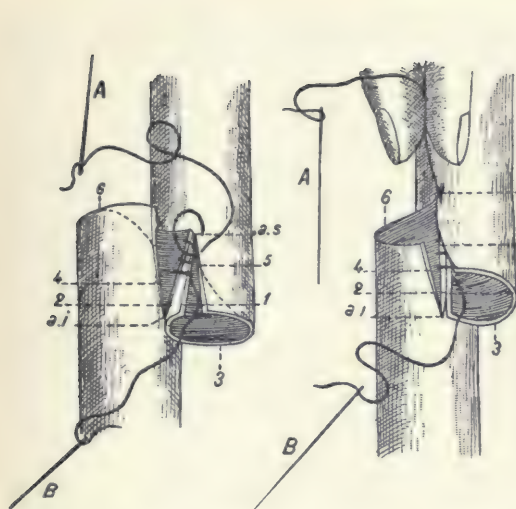


Fig. 1. The two ends of the ureters are brought together and slit; edges 1 and 2 and superior angle sutured.

Fig. 2. Showing method of firmly closing superior angle of slit.

Soresi, A. L.: A New Method of Anastomosis of the Ureters (Une nouvelle méthode d'anastomose des ureters; la méthode oblique). *Rev. de chir.*, 1917, lii, 226.

Soresi, of New York, now serving with the Italian Army, describes his method of anastomosis of the ureters which he claims has the double advantage of being easily executed, thus avoiding stricture at the anastomosed point; and, if well executed, preventing escape of urine. The method is described as follows:

The two ends of the ureters are juxtaposed for about 1 cm., and are slit on the anterior wall as shown in Fig. 1. This slit should be about 1 or 2 mm. longer than the diameter of the ureter. There are then six edges, viz., four straight edges of the slits, 1, 2, 4, 5 in Fig. 1 and two circular edges, 3 and 6. Edge 1 is sutured to 2; part of the circular edge 3 to edge 4; and the remainder of edge 3 to circular edge 6. The remainder of edge 6 is then sutured to edge 5.

Two needles are employed. The suture is commenced by passing needle A through edges 1 and 2 about their middle, continuing to the superior angle; the needle is then passed through edge 5 from inside outward and then through circular edge 6 from the outside inward, keeping as close as possible to the superior angle (Fig. 2). The needle A is then abandoned and needle B taken up. It is passed through edge 4 from the inside outward as close as possible to the lower angle (Fig. 3) and traverses circular edge 3 from the outside inward. The suture continues in this fashion until it arrives at edge 5 (Fig. 4). The threads are drawn tight. After a few stitches passed through edges 6 and 5,

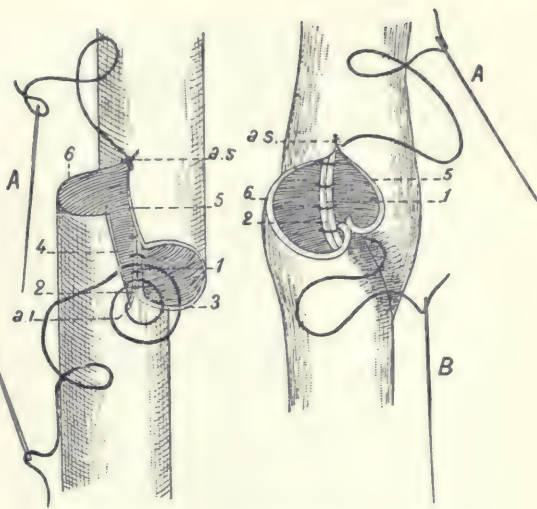


Fig. 3. Suture of remaining edges 1 and 2 and lower angle.

Fig. 4. Tightening the lower angle; edges 3 and 4 brought together and turned inward.

needle B is left and needle A again taken up and the suture of edges 5 and 6 continued, the needle passing from the outside inward on 6 and from the inside outward on 5. The threads are drawn tight so that there is no space between the edges, and the ends are then tied with two knots. Care must be taken that the suture is perfect at the upper and lower angles, because here there is a greater probability of urine leakage. The stitches should be very close so as to avoid making little pockets. Absorbent suture material must be used so as to prevent formation of calculi.

The method has been tried on one patient but the author withholds publication of this case until more cases have been operated upon. He calls the method the oblique method because the anastomosis is neither laterolateral nor terminolateral although it is apparently a combination of both.

W. A. BRENNAN.

BLADDER, URETHRA. AND PENIS

Sanchez de Rivera: A Rare and Interesting Case of Vesical Calculosis (Un caso raro e interesante de calculosis vesical). *Siglo. méd.*, Madrid, 1917, liv, 399.

The author reports the case of a man 25 years old, who for several years had pain in urinating for which treatment gave little relief. After repeated cystoscopic examinations the author discovered a calculus, the size of a large nut, which was fixed to the lateral wall of the bladder by covering layers of purulent mucus which formed part of the bladder wall and acted as a kind of pedicle to the calculus. Lavage and silver nitrate

injections repeated during some months effected a loosening of the calculus which reached the bladder fundus where it gave the usual symptoms of calculus. The condition of the bladder did not permit of lithotripsy and the author was obliged to make a hypogastric section to remove the stone.

W. A. BRENNAN.

Le Fur, R.: Retention of Urine for Four Months in a Soldier Without Prostatic Lesions (*Rétention d'urine depuis quatre mois chez un soldat sans lésions prostatiques*). *Paris chir.*, 1917, lx, 239.

For a long time cases of retention of urine among non-wounded soldiers without any clearly known cause have been observed, neither strictures nor prostatic or vesical lesions, nor medullary disturbance being evident.

A case of this kind which Le Fur relates shows that there are sometimes alterations of the neck of the bladder, and limited strictly to it, which cause the retention; and that forced dilatation of the neck eliminates the retention. In this case the man had neither syphilitic nor gonorrhoeal antecedents nor any miction disturbance before the war. Retention had lasted four months and had resisted all treatment. A hypogastric section allowed Le Fur to demonstrate that there was undoubtedly a partial atresia of the bladder neck which he treated by forced dilatation. Retention ceased after cicatrization of the wound.

W. A. BRENNAN.

Besley, F. A.: Plea for the Non-Catheterization of the Urinary Bladder in Cases of Gunshot Wounds of the Spinal Column. *J. Am. M. Ass.*, 1917, lxi, 638.

Besley warns against emptying the urinary bladder by catheterization in cases of injury to the spinal cord incidental to gunshot lesion, unless there exists a pathologic stricture of the urethra which would prevent overflow. Spontaneous rupture of the bladder seems to be an extremely rare occurrence, as the author failed to find a single case after a careful search of all histories of a 1,500-bed general hospital, covering a period of 20 years. Infection of the genito-urinary tract, on the other hand, is the most common and immediate cause of death in cases of gunshot wound of the spinal cord, accompanied by paralysis. It is almost impossible to catheterize such a patient without causing infection and subsequent inflammation of the genito-urinary tract, as proof of which an illustrative fatal case of septic pyelonephritis, brought about in this manner, is cited by the author.

Infection, on the other hand, rarely occurs without catheterization; and distention of the bladder, permitting overflow, is not harmful in these cases either to the bladder or kidneys.

The warning sounded by the author should be particularly impressed upon the attendants at casualty clearing stations of field hospitals, where catheterization of the paralyzed bladder is still practiced as a first-aid routine measure.

M. KROTOZYNER.

Artus: Congenital Urethral Stricture (*Le rétrécissement congénital de l'urètre*). *Presse. méd.*, 1917, p. 276.

It is usually held that urethral stricture is due either to gonorrhoea or traumatism. In 1913, Bazy showed the existence of congenital stricture and intimated that it appeared to be due to an arrest in the involution of the cloacal membrane; this it is known establishes the line of demarcation during embryonic life between what will later constitute the greatest part of the premembranous urethra and the membranous and prostatic urethra.

Artus describes two cases in boys of five and one-half and seven and one-half years old respectively. One of them was a heredosyphilitic and the arrest of development in the urinary and genital apparatus appeared to be the result of syphilis. Bazy had noticed the same thing in his case. The two cases seem to corroborate and confirm the hypothesis of the syphilitic origin of some congenital strictures. In Artus' two cases the stricture was made evident by incontinence of urine. This is a new contribution to the chapter of the incontinence of urine and its relation to congenital strictures and confirms the ideas put out by Bazy.

W. A. BRENNAN.

GENITAL ORGANS

Doolin, W.: The Pathology of the Retained Testis. *Med. Press. & Circ.*, 1917, ciii, 369.

Doolin was called to see a boy aged 17 years, giving a typical history of strangulated hernia. The scrotal cavity on the affected side was empty. A diagnosis of torsion of the testes retained in the inguinal canal was made. At operation a strangulated loop of bowel was found and a soft atrophic testicle of the infantile type was found close up to the internal ring. As this could not be brought down into the scrotum, it was removed.

This experience raised several questions: Was the testicle sacrificed needlessly? Why does so delicate an organ as the testis leave the protection of the abdominal cavity to take up a more exposed position? What factor or factors bring it down? What is the explanation of non-descent or of imperfect descent? What are the effects of non-descent upon the growing testis? In a case of acknowledged incomplete descent, what are the risks of leaving the testis in its abnormal position?

The literature of the subject has been searched for an answer to these questions, and a terse and satisfactory résumé of his findings is given.

A bibliography containing thirty-five references is appended.

H. A. FOWLER.

Kretschmer, H. L.: Suprapubic Prostatectomy. *Med. & Surg.*, 1917, i, 53.

During the past ten years there has been a steady and progressive diminution in the mortality rate of prostatectomy due to thorough pre-operative study

of each case as well as by refinements in anæsthesia and operative technique. The mortality rate in cases operated upon within a day or two after admission to the hospital, is very high.

A comprehensive pre-operative study should include: (1) an accurate diagnosis of the local condition at the vesical neck as well as the presence or absence of co-existing lesions in the bladder, (2) a careful study of the renal function, (3) a comprehensive differential diagnosis.

A thorough pre-operative study means a rapid prostatectomy, with less risk to the patient.

The cystoscope is also very valuable in determining the type of enlargement and aids in deciding which route is the best from which to approach the prostate.

Renal function study has been one of the biggest factors in reducing the mortality rate. Renal insufficiency still heads the list of the causes of death in prostatectomy. Of course every candidate for prostatectomy should be subjected to a complete physical examination which should include a careful study of the blood, the urine, blood-pressure, heart, lungs, and X-ray examination.

The pre-operative management consists of local treatment which has for its object: (1) improving the renal function, (2) relieving back pressure on the kidneys, and (3) cleaning up bladder infection when present.

Renal function may be improved by flushing the kidneys with water—as much as four or five liters a day may be given. To relieve back pressure on the kidneys and bladder infection the following methods are available: (1) regular systematic catheterization, followed by irrigation, (2) the use of the indwelling catheter, and (3) suprapubic drainage. So far as local management of the bladder is concerned each case demands individual consideration and treatment. Some cases will not tolerate catheterization, while with others the indwelling catheter is impracticable. Suprapubic puncture has one very serious drawback in spite of its apparent simplicity and that is the danger of injury to the peritoneum with resulting peritonitis. A more rational and eminently safer procedure is the performance of a suprapubic cystotomy under local anæsthesia. How long preliminary treatment should be carried out before prostatectomy is undertaken is an individual question. Each patient is a case unto himself. We have been guided in answering this question by the use of the phenolsulphonphthalein test. Patients with low output are subjected to the test every four or five days until their output approaches normal. It is surprising how patients who come in with a low output will rapidly

improve under management. But not to rely absolutely on the figures obtained in carrying out this test, certain clinical phenomena may be used in conjunction with the dye test.

Patients sometimes after cystotomy will show signs of renal insufficiency. With judicious treatment the tongue again becomes moist, facial expression improves, the appetite returns to normal, and the amount of urine increases. When this has occurred the author believes that the prostate may be safely removed, whether the figures of the dye test are up to normal or not.

Removal of the prostate after preliminary cystotomy should be a matter of only three or four minutes. This is one of the advantages of the previously mentioned preliminary observations which include a careful cystoscopy.

The selection of any particular type of operation or route of approach will depend in part upon the local pathological condition present and in part upon the operative familiarity with one type of operation or another.

Among the many objections which have been advanced against the suprapubic operation are: (1) higher mortality, (2) less efficient drainage, and (3) longer convalescence. There can be no doubt that at the present time the mortality rate is a trifle higher with the suprapubic operation. This fact, however, should not deter one from performing the operation, provided the cases have been carefully studied prior to the operation; ultimately this mortality rate should be placed on a par with the perineal mortality rate. The other two objections are not serious ones.

The advantages of the suprapubic operation are briefly as follows: (1) the ability to perform preliminary bladder drainage; (2) the ability to treat co-existing lesions, e. g., large stones, tumors etc.; (3) better control of hæmorrhage by means of hot irrigations and packing; (4) less injury to the bladder neck (postoperative incontinence is distinctly of less occurrence and certainly of shorter duration); (5) no postoperative fistulæ, and (6) no urethral stricture.

There is still room for improvement in the diagnosis of benign hypertrophy. Chronic prostatitis is sometimes confounded with hypertrophy. The differential diagnosis between benign and malignant enlargement of the prostate is not always easy. Cancer is more frequent in its occurrence than was formerly supposed. Cystoscopic examination and rectal palpation with an instrument in the urethra will often be of assistance. No definite diagnosis is complete without excluding disease of the central nervous system.

C. R. O'CROWLEY.

SURGERY OF THE EYE AND EAR

EYE

Fernandez, J. S.: Subconjunctival Injection of Cocaine in Cataract and Glaucoma Operations (La inyeccion subconjuntival de cocaína en la operacion de la catarata y el glaucoma). *Cron. med.-quir. de la Habana*, 1917, xliii, 158.

Fernandez thinks that although the cataract and glaucoma operations can, when circumstances require, be carried out without a subconjunctival cocaine injection, yet if we wish to proceed with security, taking advantage of all the progress made in surgery, this injection should be made. The author's visits to clinics in Europe and in the United States have impressed him with the value of this procedure. W. A. BRENNAN.

Marquez: The Ideal Methods of Cataract Extraction (Los procedimientos ideales de extraccion de la catarata). *Rev. de med. y cirug. práct.*, Madrid, 1917, xli, 219.

Marquez criticizes the Barraquer method of extraction of cataract in the capsule by suction. He thinks that in the majority of cases those methods are to be preferred in which the capsule is not extracted, relying on the surgical maxim that only such extirpations should be made as are absolutely necessary to effect the result intended. In 80 to 90 per cent of the cases extraction of the capsule is not only unnecessary but dangerous. There is no single ideal method which can be applied to every case. Each case must be treated by that particular method of extraction which the conditions call for. By the Barraquer method a suction apparatus is used to extract the crystalline lens with its capsule; this method is applicable only to a small number of cases. It is especially useful in luxation cataracts, those accompanied by a foreign body, the capsulo-lenticular, and the incomplete. Corneal suture is an excellent complement in all such cases since it prevents the loss of vitreous, which is the principal defect of extractions *in toto*. W. A. BRENNAN.

Wieden, D. J.: The Barraquer Method of Total Extraction of Cataract (Sobre el procedimiento Barraquer de la extraccion in toto de la catarata). *Siglo. méd.*, Madrid, 1917, lxiv, 533.

The author describes the Barraquer method of extraction of cataract by suction, which he thinks will eventually supersede Smith's Indian method.

With the Smith method there is liability of loss of vitreous. This is avoided in the Barraquer method as there is no pressure. Iridectomy is rarely necessary with the Barraquer method. The operation consists mainly of incision of the corneoconjunctival flap, and when this is done the lens is drawn out by

suction with a kind of cupping glass. The extraction occupies only a few seconds. The cataract slides out clinging to the cupping glass. The instrument fits over the front surface of the crystalline lens through the pupil without any injury to the iris and the cataract comes away when the instrument is gently withdrawn.

Other methods of extraction of cataract in the capsule are likely to cause hernia of the vitreous, but this does not occur in Barraquer's operation.

The author was greatly impressed lately by seeing Barraquer extract 6 cataracts at one session. He has never had any mishaps. W. A. BRENNAN.

Vollaro, A. de L.: Technique and Experimental Results of Autoplastic and Homoplastic Grafts of Large Rectangular Strips of Cornea (Tecnica e risultati sperimentali di innesti autoplastici ed omoplastici di cornea, a grande lembo rettangolare). *Sperimentale*, Firenze, 1917, lxxi, 1.

The author reviews the various attempts at and the results of corneal grafts. He describes certain experiments carried out in rabbits following a special technique of his own which is given, for the grafting of large rectangular corneal grafts. The constancy of the successful results obtained in these animal experiments leads him to think that under suitable conditions the method can with advantage be applied to the human subject provided that homoplastic, or better still if possible, autoplastic strips be employed. In leukæmia especially he thinks that good results would be obtained, and he intends to practice the method if a suitable opportunity offers. The article is finely illustrated.

W. A. BRENNAN.

EAR

Guthrie, D.: Acute Otitis Media with Paralysis of the Sixth Nerve (Gradenigo Symptom-Complex). *Edinb. M. J.*, 1917, xix, 15.

This rare complication of suppurative otitis media occurred in a patient aged 21, who, having been ill three weeks, was admitted to Bramshott Military Hospital suffering from pain in the right ear, accompanied by purulent discharge. On examination the inner half of the right meatus was found intensely red, and likewise the tympanic membrane. There was a large postero-inferior perforation through which protruded small polypi; discharge was slight, muco-purulent, and non-fetid. Two days after admission the patient complained of a stabbing pain at the back of the right eye, and of double vision. There was internal strabismus of the right eye, and the move-

ment of abduction could not be carried out. Two weeks after admission the radical mastoid operation was performed. The mastoid process was of a distinctly "pneumatic" type, so much so that it was difficult to know where to stop in operating, as compact bone was nowhere encountered: most of the cells contained sticky muco-pus. The attic and aditus were found filled with granulations and small polypi; the ossicles were not carious. A small area of dura which was exposed appeared to be healthy; no pus was found in relation with it. Ten weeks after operation the ear was dry and clean, and the ocular paralysis had so improved that almost full abduction was possible.

Gradenigo describes the symptom-complex as "an acute middle-ear suppuration accompanied by intense unilateral headache and paralysis of the abducent nerve." The pathology, in his opinion, consists in a spread of infection from the tympanic cavity along the cells which surround the bony part of the eustachian tube, toward the apex of the petrous temporal; here the sixth nerve is closely related to the bone and, as it traverses the narrow cleft known as Dorello's space, is readily liable to suffer from the effects of pressure. Dorello's space is a triangular osseofibrous canal bounded by the petrous apex, the posterior clinoid process, and the petrosphenoidal ligament. In this region the

sixth nerve is extradural and isolated from other nerves, and it is easy to see how it may be pressed upon and involved in suppuration affecting the apical pyramidal cells.

Since Gradenigo's publication Wilkinson described a case of otitis with abducens paralysis, which proved fatal from meningitis. Postmortem revealed an abscess cavity at the apex of the petrous temporal, and the track of infection from the tympanum along the cells surrounding the eustachian tube to the carotid canal, and thence to the area of spongy or cellular bone at the apex of the pyramid, was clearly demonstrable in a section. He suggested that if one could with certainty diagnose such an abscess, it might be approached and drained by stripping the dura from the roof of the petrous bone.

P. G. SKILLERN, JR.

Heiler, I. M.: Gumma in Fossa of Rosenmueller Causing Deafness. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 70.

In this instance, three intravenous injections of neosalvarsan in one month caused disappearance of the growth and return of hearing. Examination of the literature showed this form of solitary tertiary lesion to be uncommon. This patient was entirely free from symptoms referable to syphilis, deafness being the only complaint. OTTO M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Sluder, G.: A Surgical Consideration of the Upper Paranasal Cells. *Ann. Otol., Rhinol. & Laryngol.*, 1917, xxvi, 353.

The procedure described has been satisfactory to the author's mind for ten years. It may be limited to the frontal sinus, providing a very high cut of the middle turbinate, which is called "cribriform or infundibular turbinectomy," is made. The cut is actually two or two and one-half millimeters from the cribriform plate and may be extended to the most anterior limit of the infundibulum.

This very high cut may be carried backward to include the capsule of the ethmoid, under which condition not only is the middle turbinate removed, but the uppermost line, and usually all the other ethmoidal cells are opened wide into the nasal cavity. And when desirable the entire anterior wall of the body of the sphenoid from its uppermost limits, with all its postethmoidal association and much of its floor, may be removed.

In 1907 the author published an elementary text in which he described a surgical method which was at that time novel. It consisted in approaching the turbinate from above on its inner side. Prior to that all surgical approach was from below laterally upward, removing it by scissors or snare, or a combination of these or such working instruments. He described a knife consisting of a handle, a shaft, and a cutting end turned at a right angle to the shaft and sharpened so as to cut on the inside of the right angle — i.e., on the pull. It was also sharpened on a face parallel to the shaft, which at the same time gave it far more strength than a hook could have were it sharpened on its concavity. The knife, although possessing great strength, is so small that it may readily enter spaces which larger instruments can not.

The intranasal surgery of the upper cells may be performed by this method in any part or the whole as conservatively or as radically as desired. The ability to place the incision safely two millimeters below the cribriform plate in any part or in the whole length of its extent seems to be the most advantageous, and not a small part of this advantage is the power to extend this incision to the foremost limit of the infundibulum, thereby opening the inlet of the frontal to its widest natural possibilities. It is most desirable to preserve the natural inlet here, and this is done by a cribriform turbinectomy which leaves undisturbed the histologic epithelial covering of the normal inlet — i.e., the uncinat process, the bulla ethmoidalis, the hiatus semilunaris and infundibulum — re-

gardless of the anatomic variations of the frontal inlet. Should these parts be wounded, as in a curettement, the resultant scar tissue blocks the inlet. The angle knife removes by cutting any desired tissue with the least possible trauma to the surroundings. In the sphenoidal district it opens the uppermost and lowermost possible parts of the face, which has the advantage sometimes of opening also a postethmoidal cell which may occupy part of the body of the sphenoid. (Such a cell is often the cause of the entire clinical picture). The angle knife is so small that it takes up the minimum room, and so leaves the small field open to the best vision possible. Its execution is always in the direction away from the danger zone. The author so far has not seen such satisfactory post-ethmoidal surgery by other methods. Satisfactory execution is necessary, particularly in eye lesions.

This entire performance may be accomplished within a short time. The author has often finished the high frontal ethmoidal and sphenoidal combined operation in two minutes.

OTTO M. ROTT.

THROAT

McKenzie, D.: Some Hints on the Tonsil-Adenoid Operation Based on an Experience of 5,000 Cases. *Practitioner*, Lond., 1917, xcix, 109.

Some of the aphorisms offered are:

1. In middle suppuration, always examine for adenoids. The same rule holds good in the familiar fleeting acute catarrhs of the middle ear.

2. In acute suppuration of the middle ear, do not operate on the throat until the acute ear symptoms have subsided.

3. Before operating make sure that the mouth is reasonably clean.

4. Avoid passing the finger into the nasopharynx after the operation has been finished. If it is necessary, use rubber gloves.

5. Severe tonsillar hæmorrhage, though often termed reactionary or secondary, is seldom either. It is usually primary.

6. After all operations on the nose or throat, the patient, no matter what his age, when put back to bed should not be allowed to lie on his back. He should be laid semiprone on his side with face turned half-down, and with a basin or bowl under the mouth and nose.

7. Always visit the patient not later than three hours after the operation.

8. When about to examine the bleeding throat of a conscious patient, first of all insert a mouth-gag.

9. No case of deafness can be considered properly examined without the nasopharyngoscope.

Commenting on points of technique, the author prefers to remove tonsils in children with the guillotine; and in adults, with the snare. For adenoids, the La Force adenotome is preferred. As to anæsthetic: in infants under one year no anæsthetic is used for removing adenoids; from the second year onward until puberty, ethyl chloride is preferred; after puberty, nitrous oxide or chloroform for adenoids. For removal of tonsils in adults, chloroform is used. Operating under local anæsthesia is not a popular procedure in England.

OTTO M. ROTT.

Powers, G. H.: Report of a Case of Congenital Anomaly of the Larynx. *Boston M. & S. J.*, 1917, clxxvi, 843.

The case reported was that of a web between the vocal cords, which was treated by tracheotomy and dilatation of the opening made into the web, which gradually resulted in a permanent opening sufficient for breathing. In addition to this web, the patient had webbed toes, which latter was found to be a family trait.

OTTO M. ROTT.

Arrowsmith, H.: Present-Day Aspects of Laryngeal Tuberculosis. *N. Y. M. J.*, 1917, cvi, 245.

In contrast to the former indifferent methods of treating this condition and the unsatisfactory results thereby obtained, the author draws attention to the happy results of direct treatment of lesions by the aid of the suspension laryngoscope. Amputation of epiglottis and galvanocauterization of superficial ulcerations give happy results. Tuberculomata and infiltrated masses may be cleanly excised and for infiltrated areas and abscesses occurring with perichondritis, the deep puncture with a fine cautery tip gives excellent results.

OTTO M. ROTT.

Grant, J. D.: Case of Laryngeal Stridor Due to Chronic Osteo-Arthritis, Relieved by Dilatation. *Proc. Roy. Soc. Med.*, 1917, x, *Sect. Laryngol.*, 79.

The patient, a woman aged 60, had suffered with discomfort in her throat for over fourteen years, and in the early part of 1912 developed a hard cough and noises in respiration observed mainly during sleep. There was complete absence of abduction. She presented distinct signs of chronic osteoarthritis, and it seemed that this condition was

present in the crico-arytænoid joints. She obtained no marked relief until dilatation by means of Schrotter's tubes was carried out.

OTTO M. ROTT.

MOUTH

Valadier, A. C., and Whale, H. L.: A Note on Oral Surgery. *Brit. M. J.*, 1917, ii, 5.

The advance in surgery of the jaw and face has been gradual but as the result of experience a few points stand out distinctly.

Loose fragments of bone and loose teeth should be left in if possible. In the maxilla if the tuberosity carrying a molar tooth is separated by fracture but the mucoperiosteum is intact it should be preserved in place by any convenient method. Transverse fractures through both maxillæ producing a downward sag *en masse* will heal in six weeks if held in place.

The displacement of fragments in complete fracture of the ramus is often obstinate and if there is a gap suitable for neither wiring nor bone-graft occlusion of teeth in this type is obtained by building up the depressed side with vulcanite or a metal gutter on which teeth are fixed.

In case of loss of soft parts the facial nerve is often involved. Anastomosis of the nerve in the presence of cicatricial tissue is impracticable. A good result is obtained by elevating the angle of the mouth by a plastic operation.

A wound no matter how fetid in the neighborhood of the ramus should be closed as soon as possible, drainage being provided by a stab wound beneath the chin.

In forming flaps in the cheek, better blood supply is obtained by undercutting dermis in the first third, including fat and subcutaneous tissue in the middle third and deep structures also in the proximal third.

In general in dealing with facial wounds it is advisable to delay considerably before doing final and finishing operations but not before primary sewing up.

The most common sequelæ of war injuries of the jaw have been recurrent secondary hæmorrhages, inhalation pneumonia, gangrene of lungs, and mediastinitis.

To January, 1917, among 1,010 cases there were 27 deaths, 7 of which were from pneumonia.

C. A. HEDBLUM.

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SURGERY OF THE HEAD AND NECK

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SURGERY OF THE EXTREMITIES

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